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TRANSACTIONS

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TRANSACTIONS

OF THE

LINNEAN SOCIETY.

I. *The History and Descriptions of four new Species of Phalæna.*

By the late Mr. John Beckwith, F. L. S.

Read March 3, 1789.

IN the present advanced state of Entomology it is not often to be expected that much of the Natural History of new and extremely rare species of insects can be obtained. The methods which many of them take to screen themselves from observation in their first stages of life (too often successfully for the Entomologist) are not more various than they are interesting and curious. Of the Lepidoptera, that order of insects whose beauty has invited most Entomologists particularly to attend to it, many of the caterpillars feed enclosed within the stems of herbaceous plants; others in the branches or trunks of trees; a few within fruits and buds of flowers; some upon the roots of plants; others again float upon the surface of the water, between the leaves of aquatic vegetables, woven around them with inimitable art; and a much greater number

ber than is generally supposed escape our notice by taking their nourishment only in the night. Of this kind, one of the following Caterpillars is an instance. And, though many feed more conspicuously upon the leaves of trees and plants in the day time, yet a considerable number of those, as if conscious of the similarity of their colour to the undersides of the leaves, and of the safety they derive from attaching themselves thereto, are seldom to be seen but in that situation. Many others, of the family of *Phalænæ Geometræ*, will very frequently fix themselves upon the trunks or branches of trees, in an almost erect attitude, and remain motionless for several hours together; and their roughness and colour, in general so nearly resembling that of the bark, aiding the deception, a person not used to such appearances, and often a good connoisseur, would not hesitate to pronounce them mere lifeless twigs, or decayed branches of the trees.

These various methods of eluding our sight, added to the uncertainty of breeding many species when procured, have prevented our being acquainted with the larvæ of the far greater part of the *Lepidopterous* insects. In the course of several years endeavours to promote so desirable an object as the ascertaining them more generally, various observations upon, and drawings of larvæ, &c. were made, which produced undescribed *Phalænæ*, among which I apprehend are the four following *Noctuæ*.

The larva tab. 1. fig. 1. is of a pale greenish yellow; two rows of minute white specks are placed longitudinally on each side: these, upon the pale ground colour of the caterpillar, are scarcely to be distinguished at first sight: the head is red, and the whole caterpillar perfectly smooth: it feeds upon the oak, enclosed within two or three leaves slightly spun together, and generally places itself in a curved position when at rest, as in the figure. About the end of June it attains its full growth, and spins a weak web, usually
among

among the leaves, within which it produces the pupa, as at fig. 2. of a dark reddish brown colour, very glossy, short, and thick, the abdomen terminating in a sharp point. The *Phalæna* itself, fig. 3. appears, in ordinary seasons*, about the second week in April following: it is exceeding rare; but I met with the larvæ two successive years in the neighbourhood of Brentwood in Essex, and bred them with ease and certainty.

Descr. *Phal. Noctua Chrysoceras*. *Spirilinguis cristata*, antennis flavis, thorace alisque anticis sulphureo-olivaceis nebulosis, posticis albidis fuscescentibus.

Expansio alarum, 1 unc. 4 lin.

Thorax antice linea transversa alba. *Alæ superiores* sulphuræ nebulis olivaceis. *Stigmata* duo approximata invicem averfa nigro marginata; strigæ nigræ per interiorem partem varie discurrunt: marginem exteriorem versus striga alba ferrato-dentata, ad marginem ipsum striga nigra repanda, sinibus areolas albas fovens.

It may be observed of these moths, that they differ much in the characters upon the superior wings, the most perfect and beautiful having the yellow dentated and undulated lines, &c. very distinct; but in others the yellow is so blended with the black as nearly to obliterate all the markings, and the moth appears of a dirty olive colour with indistinct blackish clouds.

Fig. 4. is a larva which bears a great affinity to the former. The body is of the same pale yellow colour, and the head likewise red. It differs chiefly in the want of the longitudinal rows of white

* *Phalænæ* in general, but particularly those whose natural time of appearance is in the spring, will be sometimes produced in an early season a month or more before their usual time; a backward season retarding them in the same proportion.

spots, and in a superior degree of thinness and transparency of the skin and humours, through which the intestines very visibly appear. This circumstance renders it extremely liable to be injured in beating from the trees. Its food is the poplar, upon which I have repeatedly found it near town about the end of September. In the beginning of October it generally prepares for its transformation by enclosing itself between two leaves, whose edges it unites by a great number of pretty strong threads. The Chrysalis, fig. 5. is of a reddish brown, and of the usual form.

The Phalæna, fig. 6. is produced from it about the end of May or beginning of June in the next year.

Descr. Phal. Noctua *Gemina*. Spirilinguis cristata, alis superioribus cinereo-fuscescentibus, fasciis duabus strigosis maculisque duabus niveis intermediis.

Expansio alarum, 1 unc. 2 lin.

Basis alarum superiorum cinereo-fuscescens; intra medium fascia lata e strigis quatuor nigris confecta; in ipso medio maculæ duæ nivæ, interior orbicularis, exterior subrotunda postice biloba; extra medium fascia e striis sub tribus undulatis; in apice marginis antici lineola obliqua nigra. Alæ inferiores fuscescentes superioribus pallidiores.

The larva, fig. 7. has the back and belly of a pale livid colour; along the middle of the back is a row of white rhomboidal spots, one in each segment; the sides are of a dark brown, the lower extremity being edged with a white line. I have met with it near the roots of willow trees, concealed under the earth or tufts of grass, on removing of which it is discovered: it ascends these trees in the evening to feed upon the leaves, and returns in the morning to its place of retirement, remaining the whole of the day concealed. This constant practice is probably to avoid the attacks of Ichneumons

mons or other enemies. If so, it is not always successful; for though I took several in the years 1785 and 1786, yet in the year 1787, out of twenty larvæ which I procured, but one *Phalæna* was produced, the remainder appearing to have been destroyed by Ichneumons, which had permitted them to enter the earth, and undergo their metamorphosis, as I found most of the chrysalides dead, with their crustaceous coverings swelled and distorted, and a single large silky cone within each of them. I was not fortunate enough to breed any of the Ichneumons.

Frequent opportunities occurred of observing that the same œconomy of feeding only in the night, subsisted among these caterpillars in the cages in which they were kept for breeding, as in the night time they were always distributed over the leaves placed for their food; but during the day appeared to be all lost, except one or two which were occasionally seen; and this I accounted for from the cages admitting the light but faintly.

These caterpillars arrived at their full growth the last week in May, when they changed in the earth to slender brown chrysalides, one of which is shewn at fig. 8. The moth, fig. 9, came out the end of June.

Descr. *Phal. Noctua Pulla. Spirilinguis cristata*, alis deflexis superioribus fusco-ferrugineis subnebulosis striga alba undulata.

Expansio alarum, 1 unc. 4 lin.

Alæ superiores ex fusco dilute ferrugineæ nigroque subnebulosæ. In medio versus marginem crassiores duæ maculæ: quarum interior subrotunda, exterior reniformis albido obsolete cinctæ; linea alba undulata prope marginem exteriorem. Alæ inferiores cinereæ. Anus barbatus.

Fig. 10. is a larva of a beautiful green colour; through the transparent skin and humours the intestines are conspicuously

spicuously seen. It is the most slender larva of a Noctua that I ever observed, and at first sight greatly resembles many of the Geometrae, whose motion likewise it in some degree imitates. I found it upon the fallow near Brentwood on the 18th of June, and it went into the earth in about a week. The pupa I am unacquainted with.

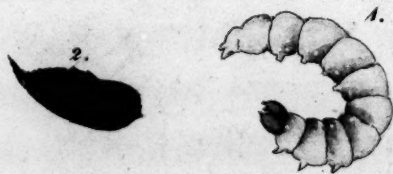
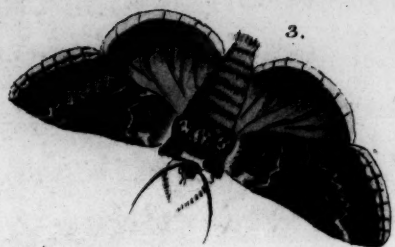
The Phalæna, fig. 11. was bred from the above larva on the 24th of July; in its perfect state it runs with great celerity in the day. It is extremely rare.

Descr. Phal. Noctua *Chrysoglossa*. *Spirilinguis cristata*, alis superioribus griseis subfalcatis strigis tribus albis primoribus abbreviatis.

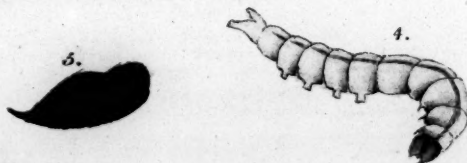
Expansio alarum, 1 uncia.

Lingua flava. Alæ superiores subfalcatae, fuscescentes, sive albidæ atomis fuscis conspersæ, in ipsâ basi striga albida abbreviata, paullo intervallo striga albida continuata. Extra hanc duæ maculæ fuscae quarum interior subovata, exterior reniformis, albidâ lineâ cinctæ. Intra marginem anteriorem striga albida, et linea alba ad marginem. Margo exterior strigarum omnium saturatior et maculis concolor.

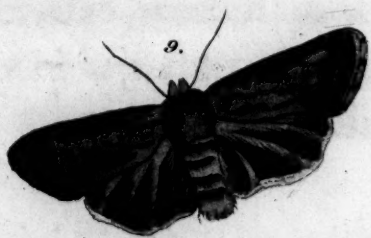
Alæ inferiores fuscescentes.



Ph. Noct. chrysoceras.



Ph. Noct. gemina.



Ph. Noct. pulla.



Ph. Noct. chrysoglossa.



II. *Remarks on Scolopendra electrica, and Sc. subterranea.* By
George Shaw, M. D. F. R. S. and L. S.

Read April 7, 1789.

AMONGST the English insects of the genus *Scolopendra* there appears to me to exist a species which is not distinctly described, and I believe is generally confounded with the *Scolopendra electrica* of Linnæus, which it so much resembles that it is not easy to give a criterion by which it may at all times be distinguished from it. The most striking difference, as to its external appearance, consists in its being of a much lighter colour than the *Scolopendra electrica*; the *electrica* being of a full brown, or approaching to a chesnut colour, while this other species is never much deeper than a straw colour. Another distinctive mark is, that it is narrower and thinner in proportion than the *electrica*; and though I have never accurately counted the number of feet, yet I am strongly inclined to think that they are more in number than those of the *electrica*. But what seems most to indicate a difference of species is the very different habitation of this insect; for while the *Sc. electrica* is found in houses, and amongst wood, linen, and other substances, the species or variety I am now speaking of is never found any where but at a considerable depth below the surface of the ground, and principally resides in garden ground, in which it may be generally found about the roots of plants at most seasons of the year, except in very frosty weather. If placed in a dry box it will scarce survive more than a single day, and frequently

quently not so long. On the contrary, the *electrica* may be always preserved in this manner at least a month, and frequently two or three months together, without seeming to lose much of its vigour; nay, it may even be kept pretty closely confined between two glasses for many days without any danger of perishing.

Another very curious particular belonging to the *Sc. electrica* (and which cannot be observed in the other species) is, that if cut in two about the middle, both parts will live and appear vigorous for a very considerable time; sometimes a fortnight; but with this very extraordinary circumstance, that the tail-part always survives the head-part two or three days; so that the principle of vitality is much more powerful in the lower part of the creature than in the upper.

This experiment I made and frequently repeated several years ago, and till lately imagined that it had not been observed by any other person; but I lately observed a remark by Haller in his *Bibliotheca Anatomica*, that the circumstance of both the cut parts living has been mentioned in a German work entitled *Unzer's Kleine Schriften*. This being a work I have never seen, I can only quote the very brief expression of Haller, viz. "*Scolopendræ dissectæ utraque medietas vixit:*" yet there is no mention of the posterior part surviving the anterior, nor is the particular species of the insect mentioned.

I am aware that it may be objected to the idea of these two sorts of *Scolopendra* being specifically different, that the different habitation of the animal, and a difference in colour, are not sufficient to constitute a difference of species, especially as some animals are supposed to reside in habitations of the greatest possible difference; the *Fasciola hepatica* for instance, which is supposed to inhabit the waters, and yet is found in great abundance and in great vigour in the liver and gall-bladder of sheep. It is also a well-known circum-

circumstance, that the larvæ of many insects are subterraneous, while the insects in their complete state inhabit the surface. Yet with respect to the two *Scolopendræ* before mentioned, I must still think that there are sufficient grounds for supposing a real and specific difference; and in order that they may the more easily be distinguished, it might not perhaps be improper to give to the species thus imperfectly described, the trivial name of *subterranea*.

I am by no means certain that the *Sc. subterranea* yields any of that phosphoric light which prevails so strongly in the other: should this be uniformly the case, there is still another argument in favour of a real specific difference.

III. *Remarks on the Abbé Wulfen's Descriptions of Lichens; published among his rare Plants of Carniola, in Professor Jacquin's Collectanea, Vol. II. 112. By James Edward Smith, M. D. F. R. S. and P. L. S.*

Read Oct. 6, 1789.

THE more eminently a naturalist has distinguished himself by his accuracy and judgment, the more dangerous to posterity are any errors he may commit in the sequel of his enquiries. I hope therefore it will not appear altogether unimportant to the Linnean Society, if I lay before them a few remarks on some unaccountable botanical mistakes in a paper of the justly celebrated Wulfen, entitled *Plantæ Rariores Carinthiacæ*, published by Professor Jacquin in the second volume of his *Collectanea*, in 1788. Still less surely shall I be in danger of censure for presuming to point out defects in the works of such able men, for it is only authors of authority whose errors are worth pointing out.

The mistakes alluded to chiefly regard the Lichens described and figured in the volume above mentioned; and these I beg leave briefly to notice, taking the plants in the order in which they present themselves.

No. 175. *Lichen tauricus*, p. 177,
is *L. vermicularis*, *Linn. fil. meth. musc.* 37. I have found it on the alps of Switzerland.

No. 176. *L. marmoreus*. p. 178.

This plant being unknown to me, I shall not presume to make any farther remarks upon it, than to observe in general, that a red or purple colour is often not natural to crustaceous Lichens, but occasioned by the urine of some animal falling upon them, to which I suspect the colour of *Lichen Oederi* to be owing.

No. 177. *L. corallinus*. p. 180.

This appears by the description to be the true Linnean plant, although the author has not noticed the foliaceous margin so remarkable in this species, by which it is proved to belong to the crustaceous Lichens, and which no writer has yet remarked. The figure is very bad, and represents an imbricated Lichen.

No. 178. *L. pertusus*. p. 181.

The plant here figured and described is the *L. scruposus* of Schreber and Dickson, totally different from *pertusus* in all its states: indeed the figure is more like a variety of *L. parellus* which I have often found at Edinburgh, very distinct from both the above.

No. 179. *L. cinereus*. p. 183.

This is a species about which I could never satisfy myself. If this figure be right, it is a valuable acquisition to botany; but I am inclined to doubt it, because it more resembles *ater* of Hudson, and Linnæus describes the margin of his *Lichen cinereus* as *black*.

No. 180. *Lichen albo-cærulescens*. p. 184.

This beautiful Lichen is probably new, if sufficiently distinct from *L. immersus* of Weber.

No. 181. *L. atro-albus*. p. 185.

The figure of this resembles *L. cæruleo-nigricans*, more than *L. atro-albus*, but the description does not accord well with either.

No. 182. *L. atro-virens*. p. 186.

I have the plant here described for the *L. sphæroides* of Mr. Dickson. It by no means agrees with the characters of the true *atro-virens*. The latter is generally supposed a variety of *L. geographicus*, but I know not on what grounds, nor can I quite remove the difficulty, as *atro-virens* is not in the Linnean Herbarium.

No. 183. *L. viridi ater*. p. 186.

This seems to be really new, but there is no figure of it.

No. 184. *L. rigidus*, p. 187,

is nothing else than *L. corniculatus* of Lightfoot, *radiatus* of Hudson, *tristis* of Weber. The figure is unworthy the works of a Jacquin, and far inferior to that of Dillenius or even Weber. The name given by Lightfoot is best worth retaining, and has the right of priority.

No. 185. *L. reticulatus*. p. 187.

I can scarcely agree with the ingenious author in making this specifically different from *L. lanatus*, merely because the ramuli adhere together. These kind of adhesions are common in *L. islandicus* and other species, and shew their approach to the nature of Fungi.

No. 186. *L. pustulatus*. p. 188.

About this there is no doubt or difficulty.

No.

No. 187. *L. polyphyllus*. p. 190.

Certainly not so, nor in any manner resembling it, but the most common appearance of *L. miniatus* Linn. just as I have found it in Scotland and Derbyshire, and as it is published by Mr. Dickson in his Collection of Dried Plants.

No. 188. *L. ochroleucus*. p. 192.

We have here a good figure of *L. muralis* of Schreber and Dickson, *saxicola* of Pollich. There is no reason why the name *muralis* should be changed, although not very good, especially as that of *ochroleucus* has been given with more propriety to another species by Ehrhart.

No. 189. *L. olivaceus*. p. 194.

In this the author is certainly right, and his remarks on it are very just.

No. 190. *L. omphalodes*. p. 196.

I am sorry I cannot say the same of this. It is by no means the *omphalodes* of Linn. and all authors, which is nearly allied to *saxatilis*, and perhaps not specifically distinct from that species. The plant here described by Mr. Wulfen is the variety of *L. stellaris* mentioned by Hudson and Lightfoot; probably a distinct species from the common *stellaris*, and totally different from *olivaceus*, to which Mr. Wulfen thinks it allied.

In the quotation of Micheli he is totally wrong, and corrects Linnæus extremely mal à propos; for this author rightly quotes Micheli *tab. 49. f. 2.* for real *L. omphalodes* in Flora Lapponica and Flo. Suecica; and the reason he omitted to cite him in the Species Plantarum was that he preferred the figures of Dillenius and Vaillant, especially as Micheli did not find the plant himself,
but

but received it from the last-mentioned author, and consequently his own information is less original.

No. 191. *L. pulchellus*. p. 199.

This appears to be the *L. tenellus* of Weber, so common on trees and bushes in England, and confounded by Linnæus with *L. ciliaris*; except that the author says it always grows on stones, and never on trees. The citation of Micheli is probably wrong, as he does not mention the ciliæ of the leaves.

The multitude of errors I have taken the liberty to notice, ought by no means to detract from the credit of this able and candid botanist, whose accuracy and care are so well known, that such errors can only be attributed to his labouring alone in the study of these very difficult plants, without the helps which conversation with others would have afforded him. Of the most eminent botanists with whom it has been my fortune to converse, scarcely more than three or four have attended carefully to Lichens; and the greater part, even of those who have written on the subject, are very much mistaken in determining the Linnean species, though assisted by Dillenius's matchless work.

IV. *Account of the Gizzard of the Shell called by Linnæus Bulla lignaria, addressed to the President. By Mr. George Humphrey, A. L. S.*

Read Dec. 1, 1789.

SIR,

I HAVE been credibly informed that the late celebrated Dr. Linnæus, when he first began his *Systema Naturæ*, intended to have taken no notice of the *Testacea*; and his reason for it was, that as the animals of the far greater part were unknown, he did not choose to describe their mere houses or shells. However, it is plain that he afterwards altered his mind; and though in his said work he has inserted only a short account of the animal of each genus of the *Testacea* in his characteristic definition thereof, yet there is no doubt but that he would have mentioned any remarkable particulars of that of each species, if he had been acquainted with any: every addition therefore to this interesting part of Conchology, however little, would certainly have been acceptable to that indefatigable Naturalist, and I presume will be equally so to his admirers. To that end give me leave, Sir, to trouble you to lay before the Society bearing his name, the following notes respecting the animal of the *Bulla* genus of *Testacea*.

Some few years past Mrs. Le Coque, who resided at Weymouth, sent up to her Grace the late Duchess Dowager of Portland, a large shell of that species of *Bulla* called by Linnæus *lignaria*, together with a curious internal part, accompanied by the following note:

“ I am

“ I am exceeding sorry this shell is broke, as I think I never
 “ met with the sort before: it had the fish in it, and I think it
 “ is as wonderful a thing of the kind as ever I saw. After I had
 “ taken it out I was endeavouring which way to preserve it, but
 “ found I could not succeed, as it was of such a fleshy substance.
 “ On opening it I found the inside to resemble a fowl's; it had a
 “ distinct *heart, liver*, and this that I have sent, which I take to
 “ be the *gizzard*, as your Grace will see by a little shell going into
 “ the inside.”

The *Bulla* and gizzard here mentioned I purchased at the sale of her Grace's Museum for Isaac Swainson, Esq: of Frith-street, Soho; and with his permission have the honour of submitting them to the inspection of the Society, together with another gizzard of the same kind, having the parts separated; accompanied by a coloured drawing of the whole, done by Mr. Lewin; which last I beg may be added to the collection of the Society.

The animal of all the species of the *Bullæ* that we are acquainted with is very large, considering the size of their testaceous part, and but a small part of it can be contained in the shell; Linnæus says it is of the limax or slug kind.

That the part called the gizzard is for the purpose of masticating its food, may be inferred not only from the shell found within that sent by Mrs. Le Coque, but also from an observation since made by John Smith Budgen, Esq. a gentleman very conversant in shells, who informed me, that from a gizzard of an animal of this kind he took a small shell, *Bulla cylindræa* of Pennant, with the animal in it.

The shell found in the gizzard of Mrs. Le Coque's *Bulla* is a small bivalve of the *Mya* genus of Linnæus; and which also accompanies the other specimens. It had the animal in it when taken out. On one of its valves there is the commencement of a circular

lar

lar perforation ; which circumstance I mention, as it may possibly throw some light on the cause of the round holes so frequently met with in shells, particularly among the bivalves; which operation has been generally ascribed to shell-fish of the *Purpura* kind. It is probable that the animal of the abovementioned *Bulla* is provided with some organ within the gizzard, for perforating such shells as are too hard to be crushed by the action of the gizzard valves against each other, in order to come at the fish. The shells of this bivalve are thick, and shut close. The animal was entire; and as it seems impossible for such shells to be broken by any force of so small an animal as that of the *Bulla* in question, it is possible that it had begun the perforation above mentioned in order to get at the enclosed meat.

Since this discovery was made, it has been found that the *Bulla aperta* of Linnæus, and *Bulla patula* of Pennant, have similar gizzards to that of the *Bulla lignaria*; and no doubt all the species properly belonging to this genus have like parts.

It is to be hoped, that these observations may induce some able anatomist to give some farther accounts of the animal of the *Bullæ* shells, especially as the abovementioned, with other kinds, are found living on our own coasts.

It only remains for me, Sir, to add a short description of the drawing, TAB. 2.

No. 1. and 2. shew the *Bulla lignaria* in two views, the back and the mouth.

No. 3. 4. and 5. exhibit the gizzard in three different sites.

The brown parts between the valves are partly fleshy and partly membranaceous, and connect the valves together:

a. is the supposed entrance into the gizzard: b. the part from whence the *Mya* was taken.

The three valves which compose the gizzard, the least of which is placed between the other two, as expressed at No. 4. are of a nature between shell and bone: the two larger, which are similar, are nearly flat. The surface of the outside, No. 6. is smooth, except a large depression in the middle, and glossy. The middle of the inside, No. 7. rises in proportion as the other is depressed, and is rough, as if intended for mastication, which its promi- nency also favours, and it also appears to be hardest there. A yellow gristly substance surrounds this part, with which it is probable the valves are moved; from whence it is finely striated to the edge, which is a little sharp.

No. 8. The least valve appears like one of the others bent out- wards, but so that the two edges do not meet, particularly at the two ends, where they are a little distant, forming a groove widest at the extremities, as seen at No. 4. The inside is rough at the centre, and has the circular gristle-like part that is in each of the other valves.

Other particulars are so well expressed in the drawing, as to need no elucidation.

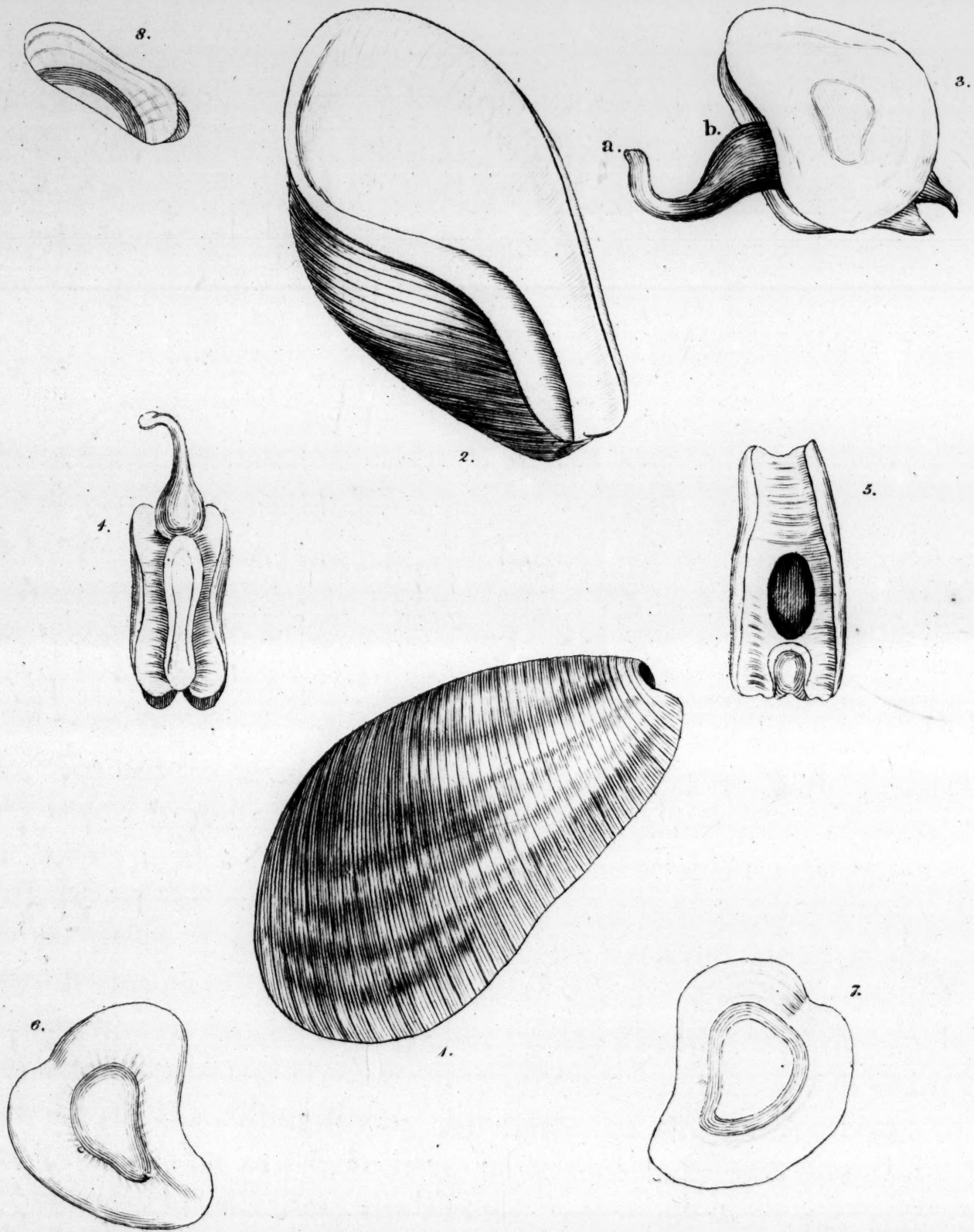
It may not be amiss to remark, that the *Bulla* is destitute of an operculum; and there is certainly no occasion for one, as the far greater part of the animal is on the outside of the shell, and cannot, on account of its gizzard, contract itself so as to retire within it: but as it resides in deep water, it is perhaps as safe there from fish, crabs, and other depredators, as those are who live nearer the shore, and barricado the mouths of their shells with their opercula.

I am, Sir,

Your obliged and most humble servant,

GEORGE HUMPHREY.

Albion-street, Surry end of Black-
Fryar's Bridge, 1st Dec. 1789.



Bulla lignaria Linn.



V. *Account of the Difference of Structure in the Flowers of six Species of Passiflora.* By Mr. James Sowerby, A. L. S.

Read Jan. 5, 1790.

CONSIDERING the *Passifloras* in general as one of the most beautiful tribes of plants yet known, I conceived a desire to collect drawings of them; but having been diverted from my intention by different and necessary pursuits, I have made but trifling progress. Nevertheless, from a partiality in their favour on contemplating so much variety in one flower, and the wonderful, and doubtless useful, organs of which some of them are composed, I have been led to investigate with some care such as have fallen in my way. It must be owned I had long passed over a principal beauty in the *Passiflora cærulea*, viz. the double row of horizontal, threadlike, radiated nectaries, if I may so call them. If the parts to which I allude be properly the nectary, surely many flowers in this genus have that organ in greater abundance than any other flower, as well as in greater variety: hence I was induced to pay attention to the nectaries in particular, and was much entertained with the distinguishing differences in the species. The larger species, as far as I have seen, have constantly two rows of principal radiated nectaries; the smaller commonly but one, and but half the number of divisions in the corolla, viz. only five, whereas the others have from ten to twelve. The repository for the honey also differs much in different species, and is a part very

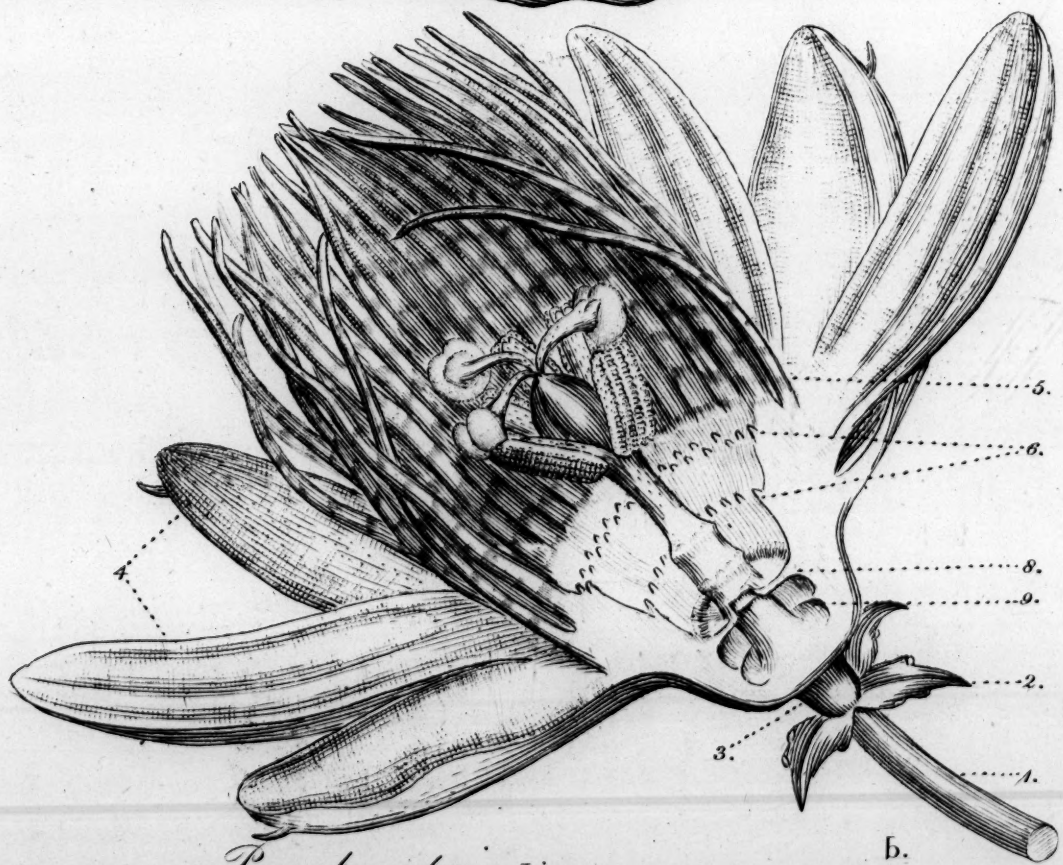
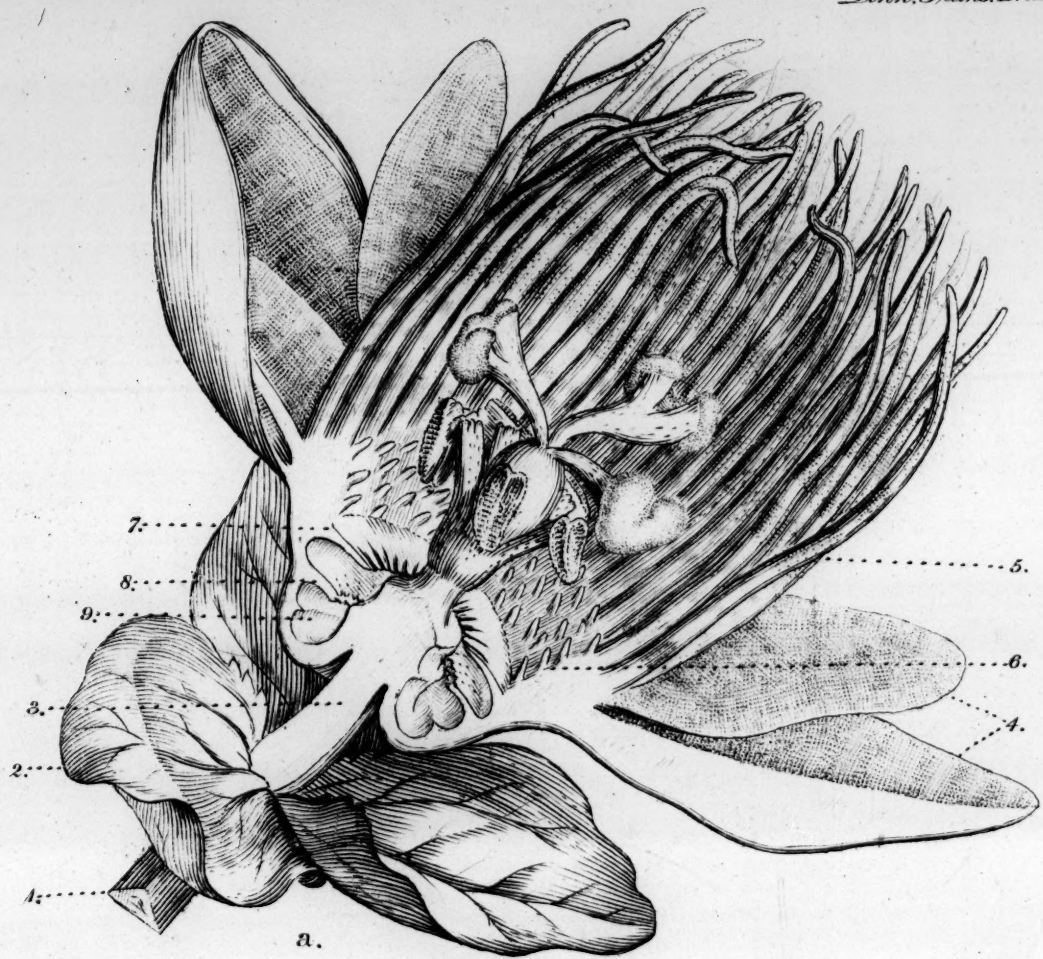
distinct from those above mentioned, which perhaps may serve as conductors, or help to screen or secure that juice. Their particular uses remain, as far as I know, to be investigated, and probably may be among the arcana of nature. There is also another sort which serves as an operculum under various forms, sometimes plaited, or plaited and fringed, besides a kind of imperfect rays in different situations and shapes, which have not yet been noticed, and might afford good specific distinctions. Even Professor Jacquin has left his *P. minima* undetermined for want of the fructification, which I presume might have perfectly settled it; for I have a specimen (which I cannot get positively determined) that resembles it in general appearance, with a plaited ruffle between the germen and the filaments, which I have not yet seen in any other *Passiflora*; but it cannot from the figure be known whether his *minima* has this ruffle or not.

Perhaps I should not have been thus particular, if there had not been so much difficulty in finding a character to distinguish the *quadrangularis* from the *alata*. It is well known that some good gardeners and botanists did not know the differences, and even thought them one and the same plant. They are certainly very much alike as to general appearance before blossoming, excepting the leaves in the *quadrangularis*, which have generally twice as many side veins, by which it is distinguished in the Hortus Kewensis; yet who that has not seen both can with certainty determine them? The flower-bud even at a distance will distinguish them pretty easily, the *quadrangularis* being rather compressed and never oblong, as that of the *alata* always is; the former being also destitute of awns: upon a nearer inspection the difference is more obvious, and I will endeavour to make it clearly understood.

I was once told that the *quadrangularis* had the narrowest leaves. I have seen it in different plants and places with narrower and

broader





a. *P. quadrangularis* Linn.

b. — *alata*.

broader leaves than the *alata*. In general, the glands on the petioles are said to be six in the *quadrangularis*, which is sometimes true; but it is not constant, and I have seen six in the *alata*, seemingly by chance.

The peduncle affords a most certain distinction, with which I therefore begin my description of the characters of these and two or three others: in the mean time it may be observed, that the colour of the plant will not distinguish them; nor can the colour of their flowers, though they differ in this respect, be allowed to form a decisive distinction.

Passiflora quadrangularis. Linn. TAB. 3. fig. a.

The *quadrangularis* is perhaps the largest and most beautiful of the *Passifloras*, apparently containing the greatest number of parts, which I will endeavour, with the help of a drawn dissection, to describe under the following heads:

- | | |
|-------------------------|--|
| 1. Peduncle, or | General footstalk of the fructification. |
| 2. Involucrum, or | Calyx. |
| 3. Pedicle, or | Flower stalk. |
| 4. Petals, | Or rather segments of the corolla. |
| 5. Principal rays, | Radiated nectaries. |
| 6. Imperfect rays, | Small, commonly irregular, protuberances. |
| 7. Imperfect operculum, | Cover to an anti-nectary. |
| 8. Operculum, | ——— the nectary. |
| 9. Nectary, | Which contains the honey. |
| 1. Peduncle | Triangular. |
| 2. Involucrum | Of three large, concave, oval leaves, serrated towards the base. |

3. Pedicle

3. Pedicle Cylindrical, rather more slender at the infertion into the concave base of the flower.
4. Petals Ten or twelve, the outer five or six thick and somewhat spongy, a little concave, broad, ending obtusely and without awns, the inner five or six thinner and smaller.
5. Principal rays Two rows close to each other, alike, awl-shaped and standing perpendicularly, or nearly at right angles with the petals, which they exceed in length.
6. Imperfect rays Four or five rows of irregularly-situated protuberances, nearly conical, very small, on an inclined or descending plane.
7. Imperfect operculum* Horizontal, partly divided into rays, which by their tips rest on a thickened part of the column supporting the fructification.
8. Operculum Horizontal and flattish at the end, which is edged with two rows of little imperfect or irregular teeth, resting on the column.
9. Nectary Round the concave base of the corolla, with a protuberating half partition on the side farthest from the column.

* This seems one part more than in any other *Passiflora*.

Passiflora alata, *Ait. Hort. Kew. V. 3. 306, TAB. 3. fig. b.*

is very like the former at first sight: the open flower has also a general resemblance, till we come to examine and make comparison, when I presume we shall find sufficient distinctions.

- | | |
|------------------------|---|
| 1. Peduncle | Cylindrical. |
| 2. Involucrum | Three divisions, small, lanceolate, with glandular ferratures. |
| 3. Pedicle | Thickest at the insertion into the convex base of the flower. |
| 4. Petals | The outer five or six oblong with an awn, the inner longer. |
| 5. Principal rays | The outer thinnest and shortest. |
| 6. Imperfect rays | A double row; below and distinct from them, a single row. |
| 7. Imperfect operculum | Wanting. |
| 8. Operculum | Partly horizontal and partly turning up to the column, then folding backward down again embraces the column*. |
| 9. Nectary | Round the column†, confined by the base of the flower. |

* This is so connected with the column that it appears inseparable, but is not joined to it.

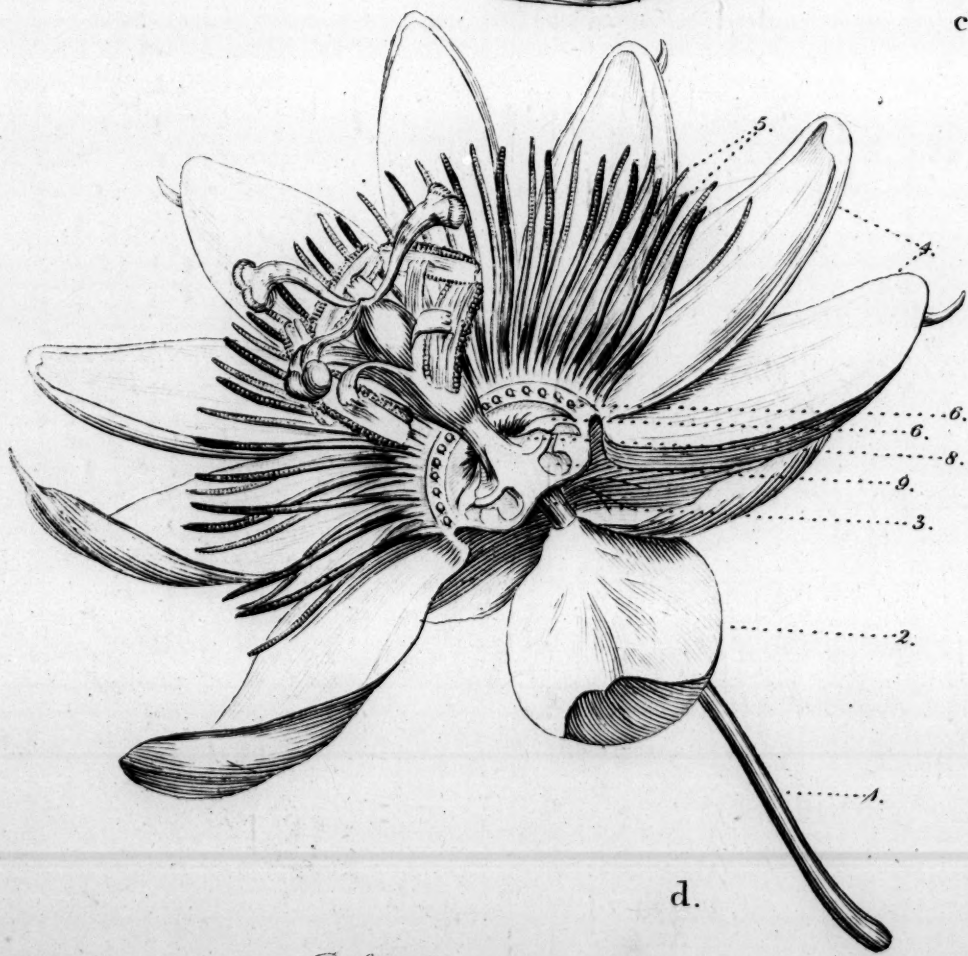
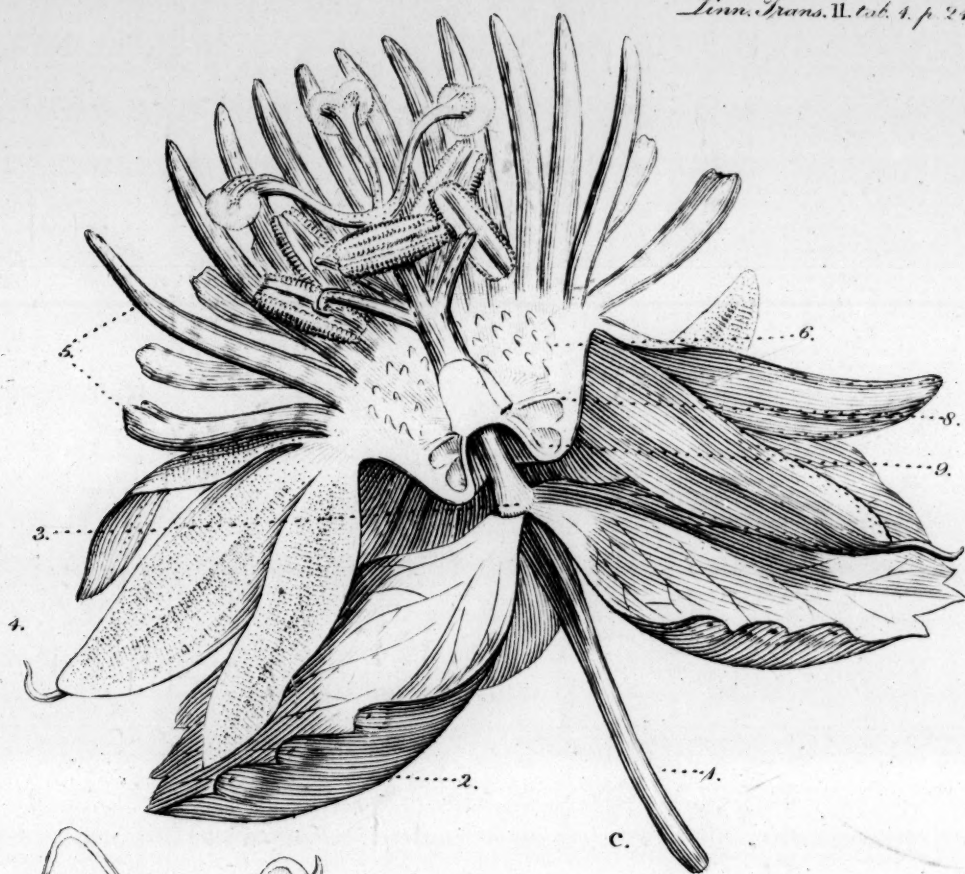
† The column comes to the bottom of the nectary, which is not the case in the *quadrangularis*.

Passiflora laurifolia. Linn. TAB. 4. fig. c.

This perhaps is sufficiently known, and distinguished by its general appearance; yet it is so remarkable in many particulars, that I could not leave it unnoticed: its beauty also seems to demand attention.

- | | |
|------------------------|--|
| 1. Peduncle | The lower part cylindrical, becoming triangular at the infertion of the involucra. |
| 2. Involucrum | Three large, concave, obovate leaves, ferrated towards their extremities with large glands, ending in two or three simple ferratures. |
| 3. Pedicle | Almost conical, narrowing into the deep base of the flower. |
| 4. Petals | Six outer lanceolate with an awn, the inner smaller. |
| 5. Principal rays | Two sets, the outer shortest, spreading diagonally, base cylindrical, apex abrupt and irregular, flattish; the inner nearer upright, some a little clavated, others bluntly awl-shaped*. |
| 6. Imperfect rays | Two or three rows irregularly situated. |
| 7. Imperfect operculum | None. |
| 8. Operculum | An horizontal plane, touching the base of the column, which confines it by spreading a little over the edge. |
| 9. Nectary | Below the base of the column, round the concave base of the flower. |

* This shews the double row of nectariferous rays plainly.



c. *P. laurifolia* Linn.

d — *caerulea* ejusd.



Passiflora cærulea, Linn. TAB. 4, fig. d.

however common, is very curious in its construction, differing in many particulars from all that I have seen. This beautiful flower is generally esteemed; and, if we examine the parts of which it is composed, it will surely add to our admiration.

1. Peduncle Cylindrical, swelling a little at the base.
2. Involucrum Three ovate entire leaves, a little concave.
3. Pedicle Cylindrical, thickening at each end.
4. Petals The outer five or six a little fleshy, oblong, rather obtuse; inner narrower and thinner, about the same length.
5. Principal rays Two rows, horizontal, threadlike, a little pointed, nearly alike, under each other.
6. Imperfect rays One regular row, with roundish heads, on little footstalks, standing erect on an horizontal elevated plane at the base of the principal rays: within these imperfect rays are a very different set, entire at the insertion, divided into threads about half way down, and inclining against the column. On the under side is a protuberance which catches the margin of the operculum.
7. Imperfect operculum None.
8. Operculum Spreading from the column under the aforesaid rays.
9. Nectary Round the base of the column, with a thick protuberance* round the side of the lower part of the flower, on which rests the operculum, and which almost divides it into two cells.

* This protuberance seems to form an antichamber to the nectary.

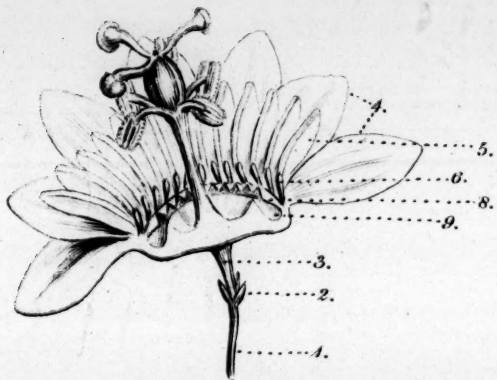
Passiflora lunulata. *Smith, Ic. Pict.* t. 1. TAB. 5, fig. e.

This is a much smaller flower than those already described, and is remarkably different in having but one row of principal rays, very different also in their form, which is quadrangular. The operculum or cover of the nectary is very different, being curiously plaited; and this is a common case with the still smaller ones. But I proceed to the different parts, continuing the former order; and as it has fewer in number, we shall of course find which are wanting, as well as the variation in those which it possesses.

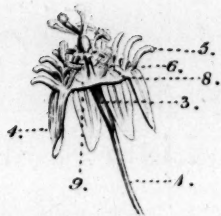
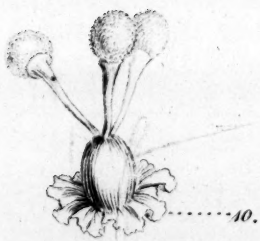
- | | |
|------------------------|---|
| 1. Peduncle | Cylindrical. |
| 2. Involucrum | Three very small, lanceolate, and entire leaves. |
| 3. Pedicle | Cylindrical, thickest at the insertion into the flattish base of the flower. |
| 4. Petals | Generally ten, the outer ovate, rather lanced, the inner shorter. |
| 5. Principal rays | One row, spreading, quadrangular, and thinnest at each end. |
| 6. Imperfect rays | One row, regular and clubbed. |
| 7. Imperfect operculum | None. |
| 8. Operculum | Regular, and plaited. |
| 9. Nectary | Round the bottom of the flower nearest the outer part, confined by a protuberating or thickened bank, arising from the base of the flower, gradually descending round the column, and making a trench about it. |

Passiflora

Linn. Trans. 11. tab. 5. p. 26.



e.



f.

e. *P. lunulata* Sm.
f. — *minima* Linn.



Passiflora minima. Linn. TAB. 5, fig. f.

This has been supposed the smallest of the tribe, whence its name, though there are others nearly if not quite as small: it is however very pleasing to see how perfect the parts of fructification are, and how nearly they resemble each other, insomuch that the species seem not yet perfectly distinguished; though I presume, when carefully examined, they will be as distinguishable as the *quadrangularis* and *alata*. I have not seen many; but among what I have seen, they are in a similar predicament with regard to the stalk and foliage. In this I have some reason to think that the ruffle under the germ (10) will make it distinct, and perhaps the fringed edge of the operculum may assist: in other respects two or three species of the small sorts seem to be exactly the same, or not to be easily known from each other. I should have observed, that they are many of them destitute of the involucre, in those that I have seen, though there is a joint between the peduncle and pedicle where we should naturally expect it: they also have but five petals, consequently have not any thing that serves as a calyx: but to proceed to the nectaries, &c.

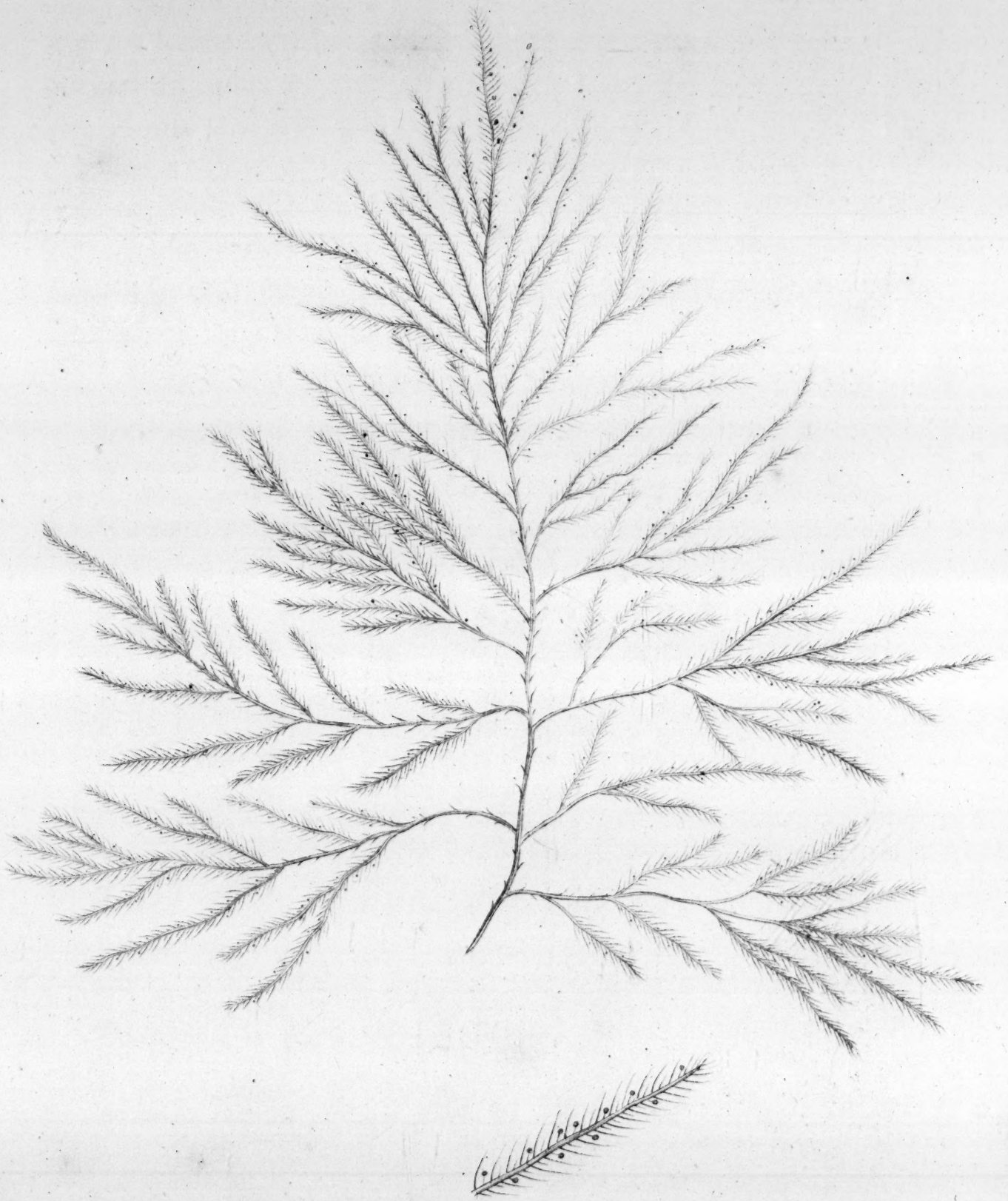
- | | |
|------------------------|--|
| 1. Peduncle | Cylindrical. |
| 2. Involucre | None. |
| 3. Pedicle | Cylindrical, curved a little, thickest at the flat base of the flower. |
| 4. Petals | Five, lanceolate, turned back. |
| 5. Principal rays | Cylindrical, spreading, curved back. |
| 6. Imperfect rays | Mostly clubbed, sometimes bifid. |
| 7. Imperfect operculum | None. |
| 8. Operculum | Plaited and fringed at the edge. |
| 9. Nectary | The same as the last, except that at the ridge of the protuberating bank are some small, regular, roundish glands, or imperfect rays, if I may so call them. |

It may not be amiss to observe here, that, in addition to the various forms in this genus, we are generally captivated with the beautiful display of their colours. In the *quadrangularis*, we cannot but admire the principal rays, from the colour being so regularly disposed in rings round them*, which is more distinct in the *alata*, making it vie with the former in beauty; in the *laurifolia* it is similar; it adds much also to the beauty of the *cærulea*. The smaller ones in general have yellow rays. The different parts are commonly spotted, or otherwise coloured, in most of them.

* These rings are red towards the bottom of the rays, alternately relieved with white, upwards becoming purple, terminating in a rich ultramarine or smalt blue towards their tops; this blue is the more like smalt, being partly powder, which if dusted on white paper we might mistake for such.



Lin. Trans. II. tab. 6. p. 29.



Fucus asparagoides.

VI. *Descriptions of two new British Fuci.* By Thomas Jenkinson Woodward, Esq. F. L. S.

Read May 4, 1790.

I. *Fucus asparagoides*, TAB. 6.

— CAULE tereti ramosissimâ, foliis setaceis, fructificationibus globosis pedunculatis alternatim oppositifoliis.

The frons is extremely tender, of a bright red colour, very much branched, and appears to be about six inches high; but whether the few specimens hitherto found are entire plants, or branches only, cannot be clearly ascertained. The stem and branches are round, the latter appearing inclined to an alternate order. The leaves are setaceous, red, or greenish, scarcely thicker than a hair.

The fructification consists of globular vesicles, or capsules, the size of the seeds of poppy, supported on short fruit-stalks, equal in length to the capsule; and the whole one-third of the length of the leaves.

This species may be placed in the *Systema Vegetabilium* in the sixth subdivision of Mr. Hudson (*fronde tereti*) next to *Fucus pedunculatus*.

This beautiful plant was found by Mr. Wigg, an Associate of this Society, among the rejectamenta left by the recess of the tide on the beach at North Yarmouth, and does not appear to have been figured or described by any author.

2. *Fucus*

2. *Fucus Hypoglossum*, TAB. 7.

— Caule alato ramosissimo, foliis lineari-lanceolatis integerrimis costâ proliferis.

The frons is membranaceous, extremely thin, bright red, about two or three inches high; divided immediately from the root into numerous branches, growing without order, and winged on each side with a thin membrane. The leaves are linear-lanceolate, very entire, sessile or on very short footstalks, growing without order, and arising from the nerve, which runs through every part of the frons: from the nerves of these leaves arise others proliferous, from two to six on each leaf, and from these again others still smaller; the extreme ones lanceolate.

The fructification appears to be dioecious—The male consisting of vesicles, the size of the seeds of mustard, of a much deeper red colour than the frons, situated on the nerve near the extremity of the leaves—Female, numerous very minute grains scattered near the nerve on each side of the leaf.

Such is the appearance, if we are to consider the fructification of these plants as dioecious; but as this is a matter of great doubt, it is possible these different appearances may be accounted for by supposing that the red vesicles are real capsules replete with seeds; and that the granular appearance proceeds from the capsules having burst, and discharged their seeds, which adhere to the surface of the frons, until that decaying, they are deposited in the place proper for their vegetation. Upon this supposition, the capsules are of course deciduous, and disappear like the seed-vessels of other known plants.

This species may be placed in the *Systema Vegetabilium* next to *Fucus alatus* in Mr. Hudson's third subdivision, *Alati, f. fronde plana, stipite medium folium percurrente*.

Leun. Trans. II. tab. 7. p. 30.



F. Hypoglossum.



A specimen of this elegant plant is preserved in the Herbarium of Sir Joseph Banks, and has been by the late Dr. Solander named as above mentioned; but his papers on the genus *Fucus* being unfortunately lost, it is unknown whence it was procured. Some time since it was found by Mr. Wigg amongst other rejectamenta on the beach at Yarmouth, and from him I was favoured with specimens in fructification; it was afterwards found by Mr. Crowe, F. L. S. at Cromer in Norfolk, growing on the rocks; and it has also been found by the Rev. Dr. Goodenough in various places on the southern coast of England.

VII. *An Essay towards an History of the British Stellated Lycoperdons: being an Account of such Species as have been found in the Neighbourhood of Bungay, in Suffolk. By Thomas Jenkinson Woodward, Esq. F. L. S.*

Read April 5, 1791.

INTRODUCTION.

THE Stellated Lycoperdons are undoubtedly to be considered as some of the most curious plants in the whole order of Fungi, both as to their external appearance, and their mode of vegetation. And as the author of this Essay has been in the habit of making observations upon them for several years, and has had an opportunity of thoroughly examining them in all the stages of their growth; the stellatum Linn. and its supposed varieties being very common, and the other species by no means uncommon in this neighbourhood; he thinks an account of his observations may not be unacceptable to the Linnean Society: the more especially as he hopes to be able to throw some new light upon the subject of these curious, and, in general, scarce plants; and to correct some errors which have been made public relating to them.

I. It appears very extraordinary that these plants should have been totally overlooked by the older authors, no notice being taken of any of them in Bauhin's Pinax; though the common puff-ball (*Lycoperdon bovista* Linn.) is there mentioned. Tournefort, Inst. R. H. 563, mentions one species, quoted from Boccone's Museum, and has figured it t. 331; but this figure represents an old and decayed

decayed specimen, the head being irregularly torn and broken. Ray, *Syn. ed. 2da, app.* also describes one species, found by Doody 1695; and in *ed. 3tia*, two species. Of these, one is the common *Lycoperdon stellatum*, of which Dillenius has there added a fig. t. 1. f. 1. and the other is referred to the plant of the 2d edit. and to the fig. of Tournefort before mentioned; but this is described by Ray, p. 28, *coli instar perforatus*, which does not at all agree with the figure of Tournefort, and seems too remarkable a circumstance not to have been noticed in the *Inst.* short as the characters there given are. Micheli, *Nov. pl. gen. p. 220*, has enumerated, and has figured, t. 100, five species, under the expressive generic name *Geaster*. Three of these are referred, but doubtfully, to the authors before mentioned; and all of them seem reducible to *Lycoperdon stellatum* Linn. or to the supposed varieties of that species. Morison, *Hist. Oxon. tom. 3. p. 641*, mentions the *stellatum*, but this is quoted from R. Syn. and not given on his own authority.

2. The first mention of the species since called by Mr. Hudson *Lycoperdon fornicatum*, appears to have been under the fanciful name *Anthropomorphus*, by Sterbeck, *Theatr. fung.* and Seger, *Eph. nat. cur.* where a cluster is figured, with human faces drawn on the heads! Which of these authors was the original, and which the copier of this absurdity, is hardly worth enquiring; but as Sterbeck's book was published in 1675, and the *Eph. nat. cur.* began in 1690, it most probably belongs to the former. Mor. *Hist. Ox. tom. 3. p. 641*, mentions the *Anthropomorphus*, and its authors, but it is only to express his admiration at the absurdity. Seg. *Eph. nat. cur. ann. 4.* two years after the first, gives a tolerably good figure of *Lyc. fornicatum*, a solitary specimen. The first notice of this plant by any British author is in the *Phil. Transf. vol. xliii, p. 234*, where an extremely good figure and an account are given by the late Sir Wm. Watson. After this an excellent representation was given by

Blackstone, *Spec. botan. p. 24. t. 2.* The first mention made by Linnæus of the *Lycoperdon stellatum* appears to be in *Hort. Cliff. ann. 1737*, after which it is mentioned in *Fl. Suec.* and *Sp. pl.*; but in the latest editions of the works of this illustrious author no notice is taken of any other similar species. It is from this probable, that, if any other had fallen under his observation, he considered them as varieties of the *stellatum* not worth noticing; it being well known that this order of plants obtained but a very small share of his attention. Haller *Hist. Stirp. Helv. tom. 3. 2174*, quotes Linnæus's *Lyc. stell.* and has referred to Watson *Phil. Transf.* and Blackstone *Sp. bot.* for (what he considers as) a slight variety of it; but informs us that he had never seen this plant. He also refers to *Eph. nat. cur.* for *Anthropomorphus*; but he has quoted the same work *ann. 4. obs. 90.* for *stellatum*, which he could not have done had he actually consulted it before he had made his reference.

3. Other more recent authors* must be passed over to come to our ingenious countryman Hudson, who deserves the warmest thanks of all English botanists, for having first completed an English Flora, in which he has with admirable sagacity adapted the Synopsis of our immortal Ray to the System of the illustrious Linnæus; a work in which the errors are so few, that, instead of cavilling at them, it must be matter of surprise, to all such as are competent to judge of the difficulty of the undertaking, that they are not much more numerous. This author, in his first edit. 1764, has enumerated, along with the other species of the genus *Lycoperdon*, two which are stellated; viz. the *stellatum* Linn. to

* It may be worth observing, that Lightfoot, *Fl. Scot. 1068*, takes notice that the *Lyc. stell. Linn.* had not then been found in Scotland; but that it probably would, as it was found in Sweden, which was farther north. This opinion has been since verified, as it was found near Edinburgh by our President, *ann. 1782.*

which he has quoted the specific character given in Sp. pl.; and the plant mentioned in the Phil. Transf. and by Blackstone, to which he has given the expressive trivial name of fornicatum, and has adapted to it a specific character which clearly distinguishes it from the other species. In this edition no other authors are referred to for this plant, but those just mentioned; but in ed. 2da, 1778, the figures of Batarra and Schæffer are quoted, and an additional place of growth is mentioned from Mr. Tofield.

4. The two species, *Lycoperdon stellatum* and *fornicatum*, as characterised by Linn. and Hudf. were considered by all British botanists as clearly distinguished and pointed out, till the publication of a pamphlet a few years since* by Mr. Charles Bryant, of Norwich, entitled, 'An Historical Account of two Lycoperdons.' This work has met with many admirers, even amongst botanists of eminence, but who have not had an opportunity of examining these plants in their native places of growth, where only, as the author justly observes, '*an accurate acquaintance with their mode of vegetation and different characters is to be obtained;*' and have consequently been misled by the specious arguments and decisive style of this publication. But though I object to the work, I am ready to do the author the justice of declaring, that I know him to be an indefatigable and, in most instances, an accurate observer and investigator of botanical subjects; and am confident, that he had no other view in this treatise, than that of communicating to the world such observations as he himself was convinced were just, and consequently useful in ascertaining some doubtful and little-known plants. I have nevertheless but little doubt that it will be made appear, that these species, *Lycoperdon stellatum* and *fornicatum*, as characterised by Hudson, are as clearly distinct as any

* It was printed at Norwich, but has not the date of the year.

two species can be; and that Mr. Bryant has totally confounded what he meant to elucidate. This has happened from his forming a theory for himself, and then torturing the account of the different specimens he has met with, to make them accord with this theory.

5. It has been observed before, that Linnæus mentions but one plant of this kind, to which he has given the apposite trivial name of *stellatum*; and has characterised it in the following words:

Lycoperdon stellatum—*Volva multifida patente, capitulo glabro: ore acuminato dentato.* Sp. pl. 1653.—Fl. Suec. No. 1277.

To this Hudson in his *Fl. Ang.* added another, under the name of *fornicatum*; which he has thus characterised.

Lycoperdon fornicatum—*Volva quadrifida fornicata, capitulo glabro: ore obtuso ciliato.* Fl. Ang. ed. 1ma, 502. ed. 2da, 644.

This perfectly distinguishes it from the *stellatum* of Linnæus, without the necessity of making any alteration in the specific character of that plant; a circumstance which very frequently becomes necessary when any new species is introduced into a genus. It is to be observed, that no notice is taken of the pedunculated head; this being at that time unnecessary, as Dillenius's figure of *stellatum*, R. Syn. ed. 3tia, and the figures of *fornicatum* referred to in Fl. Ang. represent the plants with peduncles.

6. Mr. Bryant, dissatisfied with this arrangement, from having met with a stellated *Lycoperdon* having a sessile head, was immediately impressed with an idea, that this circumstance was the only proper one to form a specific distinction (p. 10). He therefore directly concluded, that all specimens which had the head supported on a peduncle, must form one species; and all those in which the head was sessile, another. And as it was absolutely impossible,

that more than two species of stellated Lycoperdons could exist, he directly arranged all which he met with under one or the other of these species. The fornicatum of Hudson happening, unfortunately for this theory, to have the head supported on a peduncle, as well as the plant figured in R. Syn.; this difficulty could no otherwise be disposed of, than by making that plant, notwithstanding its totally different appearance and habit, a variety of his new-formed species of fornicatum. But as the specific characters of Linnæus and Hudson, though he thought proper to retain the names, would not by any means suit this disposition, he was under the necessity of forming new ones, which he has done as follows:

Lycoperdon stellatum—*Radice subcampanulata**, *volva multifida patente; tunica exteriori tenui fragili, capitulo albido sessili: ore lacerato.* Bryant's Hist. Acc. &c. p. 14.

To this are quoted as synonyms, Scop. fl. carn. 1. p. 63. n. 2. (a) —Hall. Hist. n. 2174.—Buxb. cent. 2. 45. t. 49. f. 3.

Lycoperdon fornicatum—*Radice fibrosa**, *volva multifida fornicata, tunica exteriori filamentosa, capitulo nigricante pedunculato.* Br. Hist. Acc. &c. p. 14.

quadrifidum—B.—*volva quadrifida.*

The

* Mr. B. has introduced the roots to form part of his specific characters, and he may be right in his description of the campanulated root of his stellatum, though I have never seen any other roots than such as were fusiform, terminated by a few fibres; and a root broken in the ground would necessarily put on somewhat of the appearance which he describes. Persons conversant with sea plants know that such roots are common amongst the fuci; but they also know that the most received opinion is, that the roots of these plants are no more than fulcra, or points of support; and that the plants do not derive any nourishment by their means. We can have no doubt but the roots of these Lycoperdons are designed to afford nourishment to the plant, whilst in a growing state; though from the peculiar mode of vegetation, they are lost as soon as the plants arrive at maturity,

The synonyms are, *Scop. fl. carn.* i. p. 64. (b) accedit—*Gled. Fung.* p. 152. n. v. var. a. — *R. Syn.* 27. t. i. f. i. — Neither Linnæus nor Hudson is quoted, though undoubtedly their species were supposed to belong to one or the other, and Hudson's fornicatum is acknowledged to be his (B.) quadrifidum.

7. Let any botanist compare the concise, descriptive, and discriminating characters, by Linnæus and Hudson before mentioned, with these prolix, vague, and indecisive characters* of Mr. Bryant; and determine whether it be possible to mistake the plants pointed out by the former, or to distinguish those meant by the latter. But Mr. Bryant says, the rays of the stellatum split into an indeterminate number of segments, and therefore it is an improper specific distinction: and this would certainly have great weight, if all the other species did the same; but it is expressly contrasted with the fornicatum, where the rays are described quadrifid, and therefore is highly proper. Again, he says, the distinctions '*ore acuminato*

turity, when they no longer want their assistance. It is difficult to conceive how any nourishment can be derived by a root of the kind Mr. B. supposes; and I do not know that any analogy from any other part of the vegetable kingdom can support this idea. At any rate, the philosophy of botany instructs us not to form specific characters from roots, unless others are not to be found; but such is not the case here; and from the peculiar circumstances, the roots of these plants are particularly inadmissible.

* Exclusive of the impropriety of the roots being made use of for specific characters, the outer coats are not easily to be examined when the plants are expanded. The distinctions, '*capitula albida*,' and '*capitula nigricante*,' are not founded in fact; as the heads both of Ray's plant and Hudson's fornicatum, the fornicatum and B. quadrifidum of Bryant, are whitish when freshly opened; and the head of B. only turns blackish in a short time; the head of Ray's plant or Bryant's fornicatum remains whitish or grey. He has formed his specific character therefore not from his species, but his variety. When we come to explain what Mr. Bryant's stellatum really is, the reason for his adopting these distinctions will be seen.

dentato;

dentato, and '*ore obtuso ciliato,*' are futile (p. 13); because the appearances of the mouth, and its teeth or ciliæ, vary according to the age and stages of decay of the plant. This would also have weight, were it consistent with fact; but the real truth is, that the ciliæ surrounding the mouth of *stellatum* Linn. whether opening to discharge the dust or not, have always a degree of convergency, and consequently somewhat of an acuminate appearance; though this is much more evident in some varieties than in others, as in some these ciliæ form a sharp cone*, and in others, one so blunt as to be nearly flat. The *fornicatum* of Hudson on the contrary, when full grown, has always the mouth open, and the ciliæ surrounding it forming a short cylinder; and when advanced in age, these ciliæ are sometimes even reflected.

8. From these considerations, it is asserted by Mr. Bryant, that *Lyc. fornicatum* of Hudson is nothing more than an accidental and slight variety of the plant figured in R. Syn.; and that the lower volva, or bag as it is called, is never seen but when the plant is in a state of decay, p. 36. This he attributes to the separation of the thin outer coat from decay, and from grass, moss, or mould, insinuating itself so as to cause it to fall from the other, and form the bag, p. 27. And again, p. 28. '*by the sun and drying winds getting in, and causing the two skins to flake from each other,*' and mould consequently getting between them. In the same vague and confused

* A variety of *stellatum* Linn. and Hudson, figured in Mr. B.'s plate f. 20, is a remarkable instance of this; but this is one which Mr. B. calls *fornicatum*; and it is to be observed here, and every where else, where the *fornicatum* is mentioned by that author, that it is his own species which he means, viz. the plant figured in R. Syn. and therefore here, and wherever he is endeavouring to invalidate the specific character of Hudson's *fornicatum*, he is describing one plant by another; and this unattended to has been the cause of the confusion his pamphlet has occasioned. It is not to be wondered at, that he should call the distinctions of the mouth futile, when his species *fornicatum* includes plants having the ciliæ forming a cone, and others where they form a cylinder.

manner is the arched appearance of the rays accounted for; 'by
' *the fleshy coat which is very thick upon the shoulders, as soon as it begins*
' *to shrink, pressing so forcibly upon the rays as to cause them to contract in*
' *an arched direction.*' P. 27. But so far is this from being the fact,
that this thick coat, in all the other species as well as in this, is def-
titute of any such force at all; and if the plant be left undisturbed,
as soon as it begins to shrink, cracks, and peels off, or, if it remain
on, dries to a mere thin crust; which proves its nature to be too
moist and succulent to possess any elasticity whatsoever. It will
besides be shewn hereafter, that, if the rays of this plant contract
at all, it is in breadth, and that at the same time they increase in
length; and it would be very difficult to conceive how this elastic
force (if any such there were) or pressure should act so as to produce
this double effect. If the freshly-opened plant of the stellatum
Linn. and Hudf. be taken from its native place, and carried into a
dry room, the thick coat will dry upon the rays without peeling off;
and in this case it does indeed somewhat contract them, but this
merely from its shrinking. When this happens, it is so far from
acting to occasion an arched appearance, that it only increases
any tendency the rays may have had, from situation, to contract
irregularly; instead of being incurved, as those of stellatum always
become in age, and after losing this thick coat, if free and uncon-
strained. This spongy coat in the recently-opened plant entirely
hides the peduncle, and the head appears perfectly sessile; and this
appearance sometimes continues when the plant is immediately re-
moved from its place of growth, and suffered to dry very slowly.
This may perhaps account for so many authors having described
the stellatum with a sessile head; and the figures of Schæffer, t.
182, seem to answer to this, they being evidently taken from plants
just opened. That such is the fact is very likely, as very few of the
descriptions or figures of these authors accord perfectly with the
Lyco-

Lycoperdon hereafter to be described, which has really a sessile head.

9. That Mr. Bryant's method of accounting for the double volva, and arched appearance of the rays of fornicatum of Hudson (to say nothing of the improbability, or nearly impossibility, of a fixed and permanent effect, proceeding from vague and accidental causes), is merely conjecture, and not founded on actual observation or solid argument, every botanist who has been in the habit of observing plants of the order of Fungi must readily allow; and if they recur to the pamphlet itself, they will see that the observations and arguments are not mistated. If therefore it shall be made to appear, that, so far from being caused by age or decay, the appearance of this plant, as to the principal facts, is the same throughout all its stages; and that it is subject to as little variation as almost any other plant, and to much less than by far the greater number of this order of vegetables—if it shall be demonstrated, that the peculiar appearances cannot originate from the causes assigned, no doubt will remain as to the propriety of Hudson's arrangement; and his species of *Lyc. fornicatum* will be fully re-established in the rank from which it has been endeavoured to be degraded.

10. Mr. Bryant asks, p. 39. '*If the quadrifidum be a distinct species, how comes it to pass that it is so very * scarce; when the head of a single plant (if the dust be allowed to be the seed) is sufficient to produce thousands; and yet a person who searches on purpose, where these*

* How truly philosophical and conclusive is this argument against the species, drawn from the scarcity! and yet this, curious as it is, is exceeded by another. We are told, p. 38. that Mr. B. found a quadrifid plant on the top of a bank, on the slope of which several of the stellatum of Linn. or Ray's plant grew; *therefore there was no doubt but they must have originated from the same seed.* If this argument be allowed, one may undertake to prove, that the *Onopordum Acanthium*, and *Carduus marianus*, certainly proceeded from the same seed, because they have frequently been found on the same bank.

'plants have been reputed to grow, may not meet with one in a whole season?'
 —He has not then met with it very frequently near Norwich; but though certainly a rare species, it happens to be by no means very scarce in this neighbourhood; there being several spots in which it is every year to be found, and some of these four or five miles afunder. For some years past that I have attended to these plants, I have never failed meeting with this in such of these places as have been visited; and in this respect it is much more certainly to be found than the *stellatum* Linn. which, though much more common, is rarely met with two years on exactly the same spot; and for this a reason will be presently given. In one place not less than ten of the *fornicatum* Hudson or *quadrifidum* Br. have been found within a few yards of each other; and of all, which in the course of several years I have observed in different places, not one varied in the arched form or number of its rays*. But if there were a plant accidentally discovered with five or three rays, it would no more disprove the character of the species, than finding the *Paris quadrifolia* with five or three leaves, which is not very uncommon, would disprove the identity of that plant. A specimen, it is true, has been shewn to me with three rays; but on examination, it was found that one ray, both of the upper and lower volva, was as broad as the remaining two; and they had begun to split at the points, which were separated for a small space in each. This plant was therefore accidentally prevented from taking its proper form, and yet the arched appearance was preserved, though not

* Some of these plants stood on the flat surface of the summit of a bank, others on slopes of very different angles; some amongst bushes, others on grassy banks entirely exposed; all which different situations Mr. B. says *must* occasion different appearances, and different expansions of the rays (pp. 37, 38, 39); and yet every one of these plants when fully grown corresponded with Blackstone's fig. except in size.

perfectly

perfectly regular, and the upper rays stood upon the tips of the lower. In this case therefore, evidently, *exceptio probat regulum*.

II. The Lycopodon stellatum Linn. and Hudf. with its supposed varieties, and the L. coliforme of Dickson fasc. 1. remain a considerable time in their egg* state; during which the top is nearly level with, or but little elevated above, the surface of the ground; and they have a root by which they are fixed, and by means of which they derive the nourishment necessary to their growth. When fully ripe, the volva bursts at the summit into an indeterminate number of rays; the plant is turned inside out, what was before the upper and outer surface becoming the under and inner; it is raised entirely out of the ground, and rests on the expanded rays of the volva; the root, no longer of any use, being by this expansion broken off, and left in the ground. Thus far my observations agree with those of Mr. Bryant; but it is by no means a fact, as that author asserts (p. 17), *that they have then a tendency to raise themselves on the tips of their rays; or any prehensile quality, by which they endeavour to lay hold of the grass, moss, or whatever is in their way*†. The plant being by the process just described absolutely liberated from the ground, unless accidentally detained, it depends entirely on the state of the atmosphere whether it remains flat or is contracted. If the air be moist, it will probably remain for some time

* This term is used to express the unopened volva, which somewhat resembles an egg. A plant of coliforme remained in this state apparently unchanged in size or figure near four months. This specimen, the finest and largest hitherto discovered of that curious species, is in the museum of Sir J. Banks, P. R. S.

† Though Mr. B. is speaking here of his own stellatum, which is a different plant from that of Hudson, it makes no essential difference as to these observations. Whether his plant remains flat or not, depends equally on the state of the atmosphere; but his plant changes its appearances repeatedly with the changes of the air from moist to dry, and Hudson's when once contracted preserves its form and is never again fully dilated.

flat; but if that be dry, the rays will be speedily divested of their spongy coat, which will soon crack and peel off, and then they will soon contract; and, if nothing impede their natural tendency, will be incurved, and consequently raised somewhat upon their tips. It is evident that if grass, moss, or even loose mould, should be under the plant at this time, some may be caught up and retained by them. In dry weather the thick spongy coat soon cracks, and puts on that tessellated appearance which is represented by Mich. t. 100. f. 6. and in Mr. Bryant's plate f. 4. in which state it has been considered by some authors as a distinct species: but this appearance is of short duration, being only the prelude to that coat's peeling off; after which the plant becoming very light, is frequently removed by the wind far from its native place; which accounts for this species being rarely found two years together on the same spot.

12. Such is the mode of vegetation common to *Lycoperdon stellatum* and *coliforme*; but the *fornicatum* of Hudson is of a very different nature. This plant arises from a round or egg-shaped volva, which is of a thicker substance than that of *stellatum*, and like that is fixed in the ground; but which it does not, like that, quit upon opening. The *fornicatum* when ripe splits at the summit into four equal, or nearly equal parts; the head, with a corresponding number of rays, is by the opening of the volva raised from within its cavity; and the rays in a short time acquiring firmness*, are fixed in their arched situation, each resting on its corresponding

* The spongy coat is not nearly so thick in this species, on the rays of the plant, as on the *stellatum* of Hudson, though thicker than on the *stellatum* of Bryant; and its peduncle is observable when the volva first bursts. And here it is necessary again to caution the reader to remember, that the *fornicatum* as described by Mr. B. is considered as a different plant from that of Hudson, which I am here describing; and that if it be proved that the latter is not a variety of the former, as he asserts, his description of the one plant has nothing to do with the other, and all his arguments deduced from such description must fall to the ground.

segment in the lower volva. In this process there is no actual turning inside out, as happens to the other species; and the lower volva being undisturbed, the plant remains attached to its situation, unless some much greater degree of force be applied to it than is sufficient to remove the stellatum. They are therefore but rarely found loose, or blown about by the wind; and from this, their being found for years together on the same, or nearly the same, situation is to be accounted for. Their heads are also of a much firmer texture, and do not discharge the dust or seed with so much freedom as the stellatum; and to these circumstances their greater degree of scarcity may reasonably be attributed. The root of this plant is rarely found adhering; for though the volva does not reverse itself, as in the stellatum, it is evident that the splitting and opening of the rays may break off the root; or if not, the plant soon after opening, arrives at its full growth and perfection, and the root consequently decays, and is left in the ground when the plant is taken up. That such is the mode of vegetation, I can assert, from having found a plant very recently opened, in which the head had arisen from the lower volva, and the rays were acquiring their arched situation on the tips of the lower rays. This plant was perfectly white, and much resembled the figures in Schæffer, t. 183. f. 1, 2; but on visiting the spot again two or three days after, it had acquired the perfect shape of the fornicatum, as represented in Blackstone's figure; the spongy coat had dried, and was beginning to scale; and the whole plant had acquired a deep fuscous colour. That the figure of this plant did not happen from decay is evident; and that it was not forced into such a shape by the accidental falling in of mould, &c. between the coats of the volva, is certain, because it grew on a flat surface under the shelter of a bush; and neither grass, moss, nor any other substance was found in the cavity
of

of the volva, or inserted between the arched rays supporting the head.

13. That the volva of this plant lies deep in the ground is very true; that is to say, the top of the unopened volva is usually even with the surface, or perhaps sunk just beneath it; and this very circumstance, which Mr. Bryant adduces as a proof of its being a variety, is, from its concomitant circumstances, a most convincing one of its being a real species. The opened volva, if the plant has been undisturbed, and is not actually loosened and rolling about, which is seldom the case, is always buried nearly or quite to its tips in the ground. From attending to this, it will appear evidently impossible that it should open in the same manner as the stellatum; which by its splitting at the top, and the rays absolutely reversing their situation, is raised entirely out of the ground. But Mr. Bryant says (p. 38) that, after having raised themselves out of the ground, and actually standing on the tips of the rays, the lower skin separates, and forms the bag; *'owing to the sun and dry winds getting in and causing the two skins to flake from each other; the consequence of which is, as the upper cuticle contracts, it must recede from the under, and stand upon its tips.'* It is evident, from this mode of accounting for it, that, as the lower volva is always buried in the ground, the under coat must recede from the upper, and, by some unknown power, again plunge itself into the earth, which it had some time before sprung out of; for as it is usually empty, and clear of any mould or other matter, it is impossible that any run of a bank should occasion this immersion: besides, it is often found, as has been before observed, on a flat surface, or on banks covered with grass or moss, in either of which situations it is utterly impossible that any run of the mould could take place.

14. Again: it is evident, that if two plants of the stellatum stand

nearer each other than the amount of the semi-diameters of the circles formed by the expansion of their respective rays, and these plants open nearly together, the rays of the last which expands must lie imbricated over the rays of the first. Or, if they should open at the same instant, the rays must be prevented from their full expansion, and remain supported by each other; in which case the heads must be below, or on a level with the tips of the rays on that side, whilst on the other the plants would be fully expanded*. The same appearance must happen to a single plant, if in consequence of meeting with any obstruction it is permitted only to open partially; of which instances are given by Mr. Bryant (p. 30—32), and represented in his plate, fig. 16, 17. A still stronger instance is given in the same place, of a plant, which from growing in a hole was prevented from expanding at all, and remained consequently with the rays surrounding the head. Fig. 2. of his plate, though not given with that design, well represents this; and, with the others just quoted, will fully explain and exemplify what is here asserted.

15. It seems not very uncommon for the *Lycoperdon fornicatum* to grow in pairs, forming a kind of twin plant†. I have several times met with such, and in one particular spot have for three successive years found specimens answering that description. One of these, which was gathered in the last autumn (1790), I have now the honour of laying before the Society. These plants grew on the slope of the north side of a steep bank, absolutely free from any bushes or briars, and covered entirely with grass and moss, which prevented the soil from running. The inequality of the ground

* Vide Schæff. t. 182. f. 2. where this is well exemplified.

† Batarra, *app.* p. 74. mentions receiving a twin plant of this *Lycoperdon* from a correspondent.

on which these stood, should, according to Mr. Bryant (p. 39), have occasioned an irregularity in the plants. The lower volvæ, though not absolutely coalesced, are so united, that they cannot be separated without some force and damage; it is evident therefore that they grew close together before opening; and from the soil which still adheres, it is farther evident, that they were fixed in the ground to the tips of the lower volvæ. Therefore, had these plants opened in the manner in which the stellatum is known and acknowledged to expand, they would have been in the situation which is described in the foregoing section; and the heads must have been mutually covered or shaded on the sides where they touch, by the unexpanded rays, as represented in the figures 16. and 17. there referred to: or rather, as the earth in which they were sunk must have prevented their expansion on the sides opposite to those on which they touch, they would have been represented by fig. 2, supposing another exactly similar figure joined to it. But as the arch of each is fully and regularly formed, and the volvæ regularly divided; and as from the situation on which they grew, none of the accidental causes supposed by Mr. B. could operate upon these plants; it is evident that the heads, and quadrifid arched rays, on which they are supported, must have arisen from the volvæ, and fixed themselves in their present form. A careful inspection of the specimens, and comparison of them with the figures, and with what is here asserted, will, I trust, convince any unprejudiced observer, that such must be the mode of growth of this very extraordinary plant.

16. The lower volva (or case as it really is) is of a thick and rigid substance, extremely different from the thin outer coat of the stellatum of Linn. and Hudf. as a bare inspection will evince; and the bottom of this, in the fully-expanded and perfect plant, is generally

rally flattened; the rays are usually split so far, and are broad and short; whilst those which support the head are much longer and narrower, equally split to within about half an inch of the head, and always convex outwardly, and concave inwardly, which occasions them to form rounded angles. The interior surfaces of both upper and lower volva are smooth, and shew no traces of having been forced asunder: on the contrary, a bare inspection must convince any one, that though they undoubtedly must have been in contact, they shew no appearance of having been united, except at the tips, where they so strongly adhere, that some considerable force would be necessary to separate them*. At this time the actual measurements, of what Mr. Bryant supposes corresponding parts, by no means accord; and it would be beyond the art of man, by moistening or any other process, to bring the upper and lower rays to be commensurate with each other. From what cause it is, that this growth or extension, and this arched form of the upper rays take place, we know not; but the fact is the same in all situations. It has been sufficiently proved, that this cannot be occasioned by the causes to which Mr. Bryant attributes it; and so far from having the appearance of being accidental, the whole looks much more like a work of art than of nature, and is usually taken for such by persons unaccustomed to botanical subjects. This surprisingly singular conformation has been looked upon to be the result of accident and blind chance!

* If the singular appearance of this plant be owing to the accidental separation of the coats of the volva, from decay, and the other causes to which it is attributed in the pamphlet, how happens it that they so regularly separate to the tips of the rays only? and why do not the same causes operate to separate them entirely? It would extremely puzzle the author of the pamphlet to answer this question satisfactorily; and the whole might be rested on this sole argument, were it necessary.

17. A suspicion has been before hinted, that Mr. Bryant has been led into these mistakes by finding a stellated *Lycoperdon* with a sessile head, which he with reason thought must be a different species from those which had pedunculated heads; notwithstanding Linnæus has quoted as synonyms to his stellatum, authors who have described plants both sessile and pedunculated, without even allowing this peculiar circumstance to form a variety. This appeared the more likely, as it can hardly be supposed, that so patient and accurate an observer could have described as having sessile heads, plants which are never found without the peduncle; deceived by the thickness of the interior (apparently exterior) spongy coat of the rays, which it has been before observed completely hides the footstalk of the stellatum of Linn. and Hudson, when freshly opened, and even for some days, if the plant be soon after expanding removed into the house*. It is therefore not unreasonable to conclude, that the plant called *Lyc. stellatum* by Mr. Bryant is actually the species mentioned f. 8, and which will presently be more fully described; as this is the only stellated *Lycoperdon* with a sessile head which has been met with by other botanists in this country, and as the description and figures of Mr. Bryant's stellatum perfectly accord with this plant. That this is a perfectly distinct species from the plant of Ray's syn. and consequently from the *L. stellatum* of Linn. and Hudf. will not admit of a doubt; and the small variety, which is excellently figured in Mr. Bryant's plate f. 10. is the plant, the rays of which are so peculiarly sensible to the effects of moisture or dryness in the atmosphere. This circumstance has occasioned that author to give those

* I have repeatedly brought home recently opened specimens, the heads of which have appeared perfectly sessile, and which have retained that appearance for two or three days; till, by the drying of the spongy coat, the peduncle has appeared.

fanciful descriptions of the animal nature of these plants (p. 41 et seq.); an idea which is of itself sufficient to convince the cool naturalist of the readiness with which this otherwise ingenious botanist is apt to catch at any thing which interests his imagination. To the variations of the atmosphere are also to be attributed the contraction and dilatation of the teeth or ciliae surrounding the mouth in the different species, which remain as long as any dust is contained in the head; though this circumstance Mr. Bryant also attributes to the animal nature of the plant, and supposes to be voluntary as long as the plant has life. But unfortunately for his arguments, which prove rather too much, the prehensile property of the claws (for so are the rays called) is supposed to continue even after death; as one of these plants has held an unfortunate fornicatum of Hudf. '*in its merciless gripe*' for several years in a drawer of the author's cabinet (p. 45). There can be no necessity for entering into any arguments to prove, that these appearances are entirely owing to the coriaceous nature of these plants, and that they are acted upon by a moist or dry air, exactly in the same manner as any other substances of the same kind. It was nevertheless necessary to take notice of it, as the author builds part of his system upon it, not only having an idea, that in the plants just mentioned it is spontaneous; but also (p. 17, 18) attributing a surprising degree of natural elasticity to the rays of his stellatum, from the circumstance of one of them disengaging itself with great force from a couple of pens, with which he had endeavoured to expand the incurved rays, to take a drawing of it*. It evidently appears that this proceeded entirely from the same cause, and not from any spontaneous elasticity naturally inherent in the plant, which had

* The circumstance here mentioned affords an additional proof, that this stellatum of Bryant is really the plant mentioned in the beginning of this section, and f. 3.

been removed from its natural situation on (probably) a moist bank, and directly brought into a dry room and placed upon a table.

18. This essay has been drawn out to a much greater length than was at first thought of, and for this some apology may be necessary: but it must be considered, that a principal object of it is to establish the *Lycoperdon fornicatum* of Hudson as a species; and that it was impossible to do this effectually, without answering the objections made by the author of 'the Historical Account of two *Lycoperdons*.' It must be farther understood, that these objections are scattered through 52 octavo pages, and that the corresponding observations and arguments are frequently to be sought for at many pages distance; and it may then cease to be surprising that it could not be comprised in a shorter compass, and that some flight repetitions may have unavoidably crept in. But though already much too long, indulgence must be requested for a word or two more upon Mr. Bryant's plate, which is absolutely necessary before it is concluded. The figures in this plate from 1 to 10 inclusive, are all referred to *L. stellatum*, and from 11 to 20 to *fornicatum*; but it is to be observed, that the *fornicatum* of Bryant* is the *stellatum* of Ray's syn. 27. t. 1. f. 1. and that all these figures, except 15 and 20, are professedly different appearances of Ray's plant. How much all these differ from the figures in *Phil. Transf.* and *Blackf. Sp. bot.* and also from Sch. 183. will be easily seen by comparing them together. All Mr. Bryant's figures, except 15 and 20, split into an uncertain number of rays; and these vary in their separations, as to the distance from the head, and form extremely acute angles with each other. The figures 15 and 20 are declared to be intended as representations of the *fornicatum quadrifidum*, or *fornicatum* of Hudson; and though I would not willingly accuse Mr. Bryant of having misrepresented the specimens to support his own

* Vide antea. Notes to f. 7 and 12.

system, I am under the necessity of saying, that they do by no means represent the plant fairly. Let a comparison of these figures with specimens be made; and at the same time a comparison of the figures and specimens with the figures in Phil. Transf. and Blackst. Sp. bot. and the truth of my assertion will evidently appear. Mr. Bryant's fig. 15, which is intended to represent a perfect quadrifidum, exhibits the lower rays, or divisions of the volva, equal in length and breadth to the upper, and split absolutely to the centre. The upper rays are figured flat, forming acute angles at their junction, and touching the lower only at some small distance from their tips; they are also curved in a direction never seen in this plant, except recently opened, as figured in Sch. 183. 1. but this is professedly an old specimen in a state of decay, and rolling about, the sport of wind and weather (p. 28). From these circumstances, I should have been led to suppose that Mr. Bryant had actually never seen and examined the real *Lycoperdon fornicatum*, had I not been shewn a specimen received from him, which corresponded exactly with mine, and the figures I have quoted. The only conclusion I can therefore draw (for I am very far from accusing, or even thinking Mr. Bryant capable of wilful misrepresentation) is, that he may have met with a specimen or specimens of Ray's plant, in which some of the accidents described may have taken place, and caused some variation in the appearance of the plant, and some resemblance of the double volva. The specimen from which fig. 14 was taken, which seems to have been partially buried in the ground, may have been of this sort; and with the help of a warm imagination, of which strong instances have been given, and a violent passion for forming a theory, would afford sufficient ground for this author to work upon. This is the more probable, as he has described the *Lyc. fornicatum*, *B. quadrifidum*, or *fornicatum* of Hudson's Fl. Ang. to be a plant of extraordinary rarity. But
such

such a circumstance, if it really did happen, would prove nothing against the arguments brought in favour of the specific character of that plant.

ENUMERATION.

IT now remains to enumerate the different species of stellated *Lycoperdons* which have been found in this neighbourhood; and these are presumed to be four. Of these, the stellatum of Linn. and Hudf. and the fornicatum of Hudson have been so amply treated of in the foregoing pages, that little more remains necessary, than to apply to them such synonyms as really appear to belong to the respective species. This will be an easy task in respect of the fornicatum, which has been mentioned but by very few authors; but great difficulty arises in adjusting such as belong to stellatum. Many authors have described a plant of this sort with a sessile head; and their descriptions are in general so vague, and their synonyms so confused, that it is impossible to ascertain with certainty, whether they mean the stellatum of Linnæus and Hudson; the *Lycoperdon* which I shall call after Schmiedel by the trivial name of *recolligens*; or some other plant which may be different from both. For these reasons I shall be very sparing of applying synonyms to both these species. The *Lycoperdon coliforme* of Dickson's 1st fasc. makes up the number specified.

Lycoperdon stellatum—Volvâ multifidâ patente; laciniis inæqualibus, capitulo pedunculato glabro; ore acuminato dentato. *Linn. Sp. pl.* 1653.
Hud. Fl. Ang. 643.

Diag.

Diagn. The volva is irregularly split into an uncertain number of rays; the head nearly globular, and supported on a peduncle; the mouth surrounded with ciliæ, converging into a cone; and the whole plant of a dirty white generally, but the head sometimes tinged slightly with grey.

As Linnæus has quoted Ray, there can be no doubt but his *stellatum* is the same as Hudson's; but some of the syn. quoted in Sp. pl. and his other works are doubtful, the head in them being described sessile.

Fungus pulverulentus crepitus lupi dictus, coronatus et inferne stellatus. R. Syn. 27. t. I. f. I.—This is the best representation of this plant I have hitherto seen.

Lycoperdon fornicatum. Bryant's *Hist. Acc. of two Lycoperdons*, f. 12. 13. 14. 16. 17. are undoubtedly to be referred here from his own authority.

Lycoperdon fornicatum. Relhan *Fl. Cantab.* 981. rejecting the syn. of Hudson, Schæffer, and Batarra.

Schmiedel Ic. pl. 46. certainly belongs to *stellatum*. *Pl.* 43. exactly resembles *Schæff. fig. t.* 182, and is therefore doubtful.

Pollich. palat. 1197. exactly copies Linnæus. The above are all the authors, which have fallen under my observation, that I can safely quote to this species.

Schæffer t. 182. These figures extremely resemble our plant recently opened, and before the peduncle becomes visible, but the head is described as sessile; and yet the author refers to Raii syn. and the fig. of Dillenius, which makes it probable that he had not well considered, and had not very clear ideas of these plants. It may possibly be some species which has not yet fallen under my observation.

Hall. Helv. 2174. *Lyc. cortice exteriori revoluta stellato.* No notice is taken by this author, whether the head be pedunculated

or

or sessile; and the syn. are so contradictory, that nothing can be made out from them. He quotes *Eph. nat. cur. ann.* 4. *obs.* 90. which is *Lyc. fornicatum* Hudf. for this species. *Mich. t.* 100. *f.* 6. with the tessellated rays is also mentioned as a variety, and also the plant with the rays again divided, *f.* 5.

Scop. carn. 1633 and 1634, enumerates two species, of which the first from the specific character should be *recolligens*; but the diagn. contradicts this, and his syn. will not help the difficulty. He quotes *Hamb. Mag. tom.* 5. *p.* 411. *f.* 1. for this species, and *p.* 403. *f.* 5. for *coronatum*; but these figures, which are very bad, represent the same plant. The references for *coronatum* are quite contradictory; as it is impossible that *Sch.* 182. 1. *Bat.* 39. 1. and *Mich.* 100. 3. can all represent the same plant, and *Sch.* 182. 1. and 182. 2. differ but in size from each other. The *coronatum* is described as growing on decayed trees, for so I must understand '*in truncis*' to mean, and none of our stellated *Lycoperdons* are ever found in this situation.

Mich. nov. gen. 220. *t.* 100. *f.* 1—6. Geaster. This author has described and figured six species. One of these, No. 3. *f.* 2. is described as having a short peduncle; but neither descriptions nor figures point out whether the heads of the rest are sessile or pedunculated. No. 1. *f.* 1. is doubtfully referred to *R.* syn. but from the number and regularity of the rays, the form of the head and mouth, and the apparent tendency of the rays, as represented in the plate, to turn upwards, it more resembles *recolligens*. No. 4. *f.* 4. exactly resembles *f.* 1. except that it has six rays only; and the mouth is quite naked; a circumstance which prevents its being safely referred to any British species. No. 3. *f.* 2. somewhat resembles the small variety of *stellatum*; but the head is scarcely flat enough, and the peduncle is not similar. No. 2. *f.* 3. seems to be really *recolligens*. No. 5. *f.* 5. resembles *stellatum* with the rays

split, but the mouth of this is also naked; as is f. 6. which from the number of rays and shape of the head might be otherwise recol- ligens. None of these can therefore be safely quoted for stellatum.

Bocc. Musf. t. 305. f. 4. is very doubtful.

Buxb. Cent. 2. t. 49. f. 3. is so bad a figure that it cannot be quoted with any certainty; it approaches nearest to stellatum of *Sch. t. 182.*

Dalib. Paris. 390. is impossible to ascertain, as he has neither description nor figure.

Royen. Lugd. Bat. 519. quotes *R. syn. t. 1. f. 1.* and *Mich. t. 100. f. 1, 2, 3.* It is therefore uncertain whether his plant be stellatum Linn. and Hudf. or not.

Tourn. Inst. R. H. 563. t. 331. is referred to *Bocc. Musf.* The figure is so bad, that it cannot be at all determined.

Vaill. Paris. 123. *Lyc. vesicarium stellatum* is referred to Tourne- fort without any description.

Fl. Dan. 360. may be some new species; it certainly does not at all resemble our stellatum.

Gleditsch. p. 151. has several varieties: but his species is probably to be referred to stellatum; though, as he gives no figures, it is doubtful.

Obs. When fresh opened the head is usually more or less depressed, and often somewhat oval; but when the thick coat is either peeled off, or dried upon the rays, the head usually becomes globular, and resembles the figure in *R. syn.* and the plant then appears so different, that a person unaccustomed to observe them would scarcely believe it could be the same. The peduncle is generally thickened at the top and the bottom, and smallest in the middle, or, as it may be called, doubly club-shaped; but sometimes it is cylindrical. From these different appearances, this plant has been differently

described by various authors; but probably the same, or some slight variety, has been intended by the greater part of them.

ANGL. *Star puff-ball*—In various places near Bungay in the spring and autumn, and the winter if it be mild.

β minor—The only permanent variety I have met with here, and which certainly is not distinct, may be characterised—*capitulum superne plano, ore acuminato, ciliis longioribus*. See *Bryant's Hist. Acc.* f. 19. the head only, but admirably well expressed.

This elegant little variety grows on dry banks, usually amongst ivy, and seldom exceeds an inch or an inch and half in the diameter of its expanded rays. The colour is dark brown; the head flat on the top; and the mouth surrounded with long ciliæ, forming a very sharp cone; the peduncle is longer in proportion to the size of the plant than in α .

Mich. t. 100. f. 2. may possibly be this plant. It is found in Ditchingham, Earsham, and other places near Bungay.

Lycoperdon recolligens—*Volva multifida patente, laciniis æqualibus; capitulo depresso-sphærico, sessili; ore acuminato.*

Diagn. Rays of the volva equal, 5 to 7, rarely more; when dry, reflected over the head; head sessile.

Lycoperdon volvens recolligens. *Schmiedel Icones plant.* 27, 28. f. 20 to 31. rejecting the syn. which are doubtful. The description is extremely good, but the plant is figured and described with rays from 5 to 20, equal or unequal, entire and split, which circumstances do not entirely accord with the English specimens; and possibly the author may have confounded two species together. He says of the head, '*Capitulum seu globulus volvæ medio firmiter innascitur, sessilis, absque pedunculo aliquali:*' which perfectly agrees with our plant.

Lycoperdon stellatum.—*Bulliard, Plantes de la France, t. 238.*

Lycoperdon stellatum—Bryant's *Hist. Acc. of two Lycoperdons*—*f. 3, 4, 5, 6. 10.* The specific character of Mr. Bryant's *Lyc. stell. 'capitula albida sessili'* so entirely agrees with this species, and his *fig. 10.* is so excellent a representation of the small specimens, and the others here quoted very good ones of the large ones, with which the account, p. 43, 44, also well accords, that I can have no doubt in referring his plant here.

Lycoperdon stellatum—*Relban Fl. Cantab. 980.* admitting only the syn. of Bryant and Micheli.

Mich. 1. 100. f. 3. and perhaps *1. 4. 6.*

Obs. The volva is usually divided into 5, 6, or 7 rays, which are equal, or nearly so, of a chestnut colour on the upper side when expanded, and silvery white beneath. The head spherical, considerably depressed, perfectly sessile, of a yellowish white or pale straw-colour; the mouth ciliated, and usually surrounded with a circle of a paler colour; and a similar circle is often observed on the upper part of the rays surrounding the head. The rays when moist are regularly inflected, as represented in the figures of Bryant and Bulliard; but when dry are reflected, and entirely cover the head. If they are kept in a dry place, they will at any time undergo these changes, by placing them in a saucer with a small quantity of water, and again drying them; but the changes are quicker, and more certain in the small plants, than in the large ones. The diameter of the expanded rays varies from one inch to three or four, and the size of the head from that of a pea to an inch diameter.

ANGL. *Hygrometric puff-ball*—Ditchingham and Earsham, Norfolk; Mettingham, Suffolk, near Bungay. Spring and autumn.

Lycoperdon coliforme—*Volva multifida patente, capitula depresso-sphærico, pedunculis osculisque numerosis. Dickson, Fasc. plant. crypt. 1. 24. t. 3. f. 4.—With. Bot. arr. ed. 1. 783*.*

* *Ed. 2. vol. 3. 460.*

Fungus pulverulentus coli instar perforatus. R. syn. 27. rejecting the syn. of Tournefort.

Diagn. The volva multifid, rays irregular, mouths and peduncles numerous.

Obs. The head is in the large specimens considerably depressed; in the small ones nearly spherical; of a whitish colour, and covered with a thin tunicle of a most beautiful silvery grey, peculiar to this species, but similar to that which forms the outer coat of the recolligens. The mouths are numerous, slightly elevated, and fringed with fine hairs. The peduncles, which do not appear till the thick spongy coat dries or peels off, are numerous, woody, filiform or strap-shaped; and appear to bear some kind of proportion to the number of the mouths, though there are no corresponding cells. In the small specimens the mouths and peduncles are few. It has been doubted whether these mouths might not be accidental, and formed by insects after the expansion of the plant. But this (not to mention their regularity, and that each is surrounded by its border of ciliæ) is clearly disproved, from the marks of the projections formed by the mouths being seen on the expanded rays, when freshly opened, as represented in Dickson, *t. 3. f. 4. ad litt. b.* I have likewise found an abortive plant, in which the seed did not ripen; but which had numerous projecting papillæ on the head, where the mouths should have been formed.

The volva of this Lycoperdon is sunk deep into the ground, the summit being on a level with, or very little elevated above, the surface. On taking one up, it was found to be nearly globular, but slightly depressed; of a dirty white, wrinkled and scaly; with a short thick root terminated by a few small fibres. When cut open, this consisted of a soft coriaceous coat, within which was another thicker, and of a much tougher substance, filled with a white curd-like substance, of a very disagreeable smell. This was so young that

that there was no appearance of the head. They remain a considerable time in this state, appearing to ripen slowly: one which was discovered about the middle of August, remained unchanged to the end of November, when it was found fully expanded, and resting on the surface of the ground, in which it had been before buried. This had been visited the preceding day, and not any alteration had been then observed in it. It appears therefore, that when ripe, the change is very sudden; and that the head, pressing against the interior part of the volva, and probably assisted by the action of the sun (for the day on which it expanded was remarkably bright and fine), the outer coat suddenly gives way, is split into an indeterminate number of rays; the root is broken off, and left in the ground; and the plant being turned inside out, is necessarily raised upon the surface, what was before the outer and upper part of the volva being now next to the ground. This, which has been before (f. 11.) described as the mode of expansion of the stellatum, is also common to these with the recolligens.

ANGL. *Cullender puff-ball*.—Gillingham and Earsham, Norfolk; Bungay, and Mettingham, Suffolk. In the autumn. I have never met with a freshly opened specimen of this species at any other season.

Lycoperdon fornicatum.—Volva *quadrifida fornicata*; capitulo *pedunculato*, glabro; ore obtuso ciliato.

Huds. Fl. Ang. 644.

Diagn. The volva quadrifid, and remaining in the ground when opened. The head globular, pedunculated, and elevated upon four arched rays, resting on the tips of the divisions of the volva; the mouth open, and surrounded with ciliæ, forming a cylinder; the fresh plant white; but the whole soon changing to a dark brown.

Geaster volvæ radiis et operculo elevatis. *Watson Phil. Transf. vol. 43. p. 234. t. 2. f. 11 and 12.*

Fungus

Fungus pulverulentus turriculam fornicatam referens. *Blackst. Sp. Bot. p. 24. t. 2.* a very good figure, but larger than the plant is usually found.

Fungi monstrosæ ac insolitæ formæ. *Rayger. Eph. nat. cur. dec. 1. ann. 4. obs. 90.*

Lycoperdon coronatum *Sch. t. 183.* exceedingly good figures of the plant recently opened, and before it changes its colour. The description is tolerably accurate; but the syn. are all to be rejected except *Batarra*.

Geasteroides. *Batarra fung. app. 74. t. 39. f. 1 and 4.* excepting the root; *f. 3.* seems imaginary. A twin plant is mentioned by this author.

Lycoperdon fornicatum *B. quadrifidum.* *Bryant's Hist. Acc. f. 15.*

L. fenestrati var. β and γ *Batsch. El. Fungor. 243. t. 29. f. 168. a. b.*

ANGL. *Turret puff-ball.*—Earsham, Ditchingham, Brome, and Gillingham, Norfolk; Bungay, Suffolk.—In the autumn.

POSTSCRIPT. It was at first intended to add, by way of appendix, some observations upon the *Lycoperdon Carpobolus*; which, if really a *Lycoperdon*, more properly belongs to this, than any other division of the genus. The present paper has, however, extended to so much greater a length than was originally thought of, that the author must reserve what he had to offer upon the *Carpobolus* for some future leisure, if the present communication should be thought worthy of the notice of the Society.

VIII. *A new Arrangement of Papilios, in a Letter to the President.* By
Mr. William Jones, F. L. S.

Read July 5, 1791.

DEAR SIR,

MAY I presume to offer to the consideration of the gentlemen of the Linnean Society some remarks upon Linnæus's division of the genus of Papilio, and to point out obvious distinctions by which they may be classed with more certainty? From the shape of the wings, a principal character with Linnæus, though various, yet in that variety so gradually approaching each other, I find it impossible to draw the distinguishing line: I therefore apply to anatomy for such characters as may with certainty distinguish each family from the others. The specimens that had been inspected by that great observer of nature were few in proportion to those since known; it was difficult therefore to ascertain, with the precision necessary, those distinctions that a further and more extensive acquaintance with a far greater number afforded; and yet, though his characters were not sufficiently marked, they have gone far to lay a foundation for a more correct division; and that, so far from raising new difficulties, I think points out the very scheme more clearly which Linnæus himself had adopted, and would have further elucidated, had he seen more on the same subject; for it may be presumed he was acquainted with very few more than he had in his last edition of his Systema described, only 274 Papilios; an inconsiderable number

ber if brought in comparison with what I have seen, *viz.* above 1000, in the various cabinets in London, and above 400 more in various plates published by different authors: it is not to be wondered that he had not entered into the minutiae of those distinctions which appear evident upon a farther inspection to separate the particular families. The great leading outlines therefore only struck him, and these have occasioned the mistakes that he has run into respecting some of the Achivi, which when rectified, with a few others in the other divisions, his arrangement will be clear and decisive. But without attending to these remarks it is liable to error, as may be seen by Fabricius, who happening to describe a Papilio from two different cabinets, placed it once with the Equites and once with the Danai Festivi, with either of which it might be classed by adhering only to Linnæus's indefinite characters.

I am confirmed in my sentiments hereon by observing what both Linnæus and Mr. Yeats say of Papilio Apollo, *viz.* that the larvæ of this Papilio have two horns situated on its neck like those of many of the Equites, with which family I place it; clearly shewing that the families may not only be distinguished in the perfect insect, but have frequently, if not generally, a distinguishing character in the larvæ also, and that these distinctions are not imaginary, but certain and specific. I have therefore given in the following remarks, Linnæus's characters, adding only what will more certainly fix the limits or marks of each family.

EQUITES. The upper wings are longer from the posterior angle to the point, than to the base: the antennæ often filiform.

Corrected by saying
the upper wings are longer from the posterior angle to the point than to the base, occasioned by having four nerves instead of three, visible in every other family—

the palpi frequently only a brush — under wings with a connecting nerve in the centre, and without an abdominal groove.

These distinctions will evidently preserve this family from all others by having characters peculiar to itself, but will occasion the removal of Teucer, Idomeneus, Menelaus, Achilles, Nestor (with Patroclus, which I have my doubts of being a Papilio), and a few more from the Achivi, to the Danai and Nymphales with which they more properly ought to be arranged. It will also bring to this division from the Heliconii, Apollo and Mnemosyne; and from the Nymphales, Rumina, Panope, Diffimilis, and perhaps one or two more. — I remark there is not one arranged with the Troes but what is truly an Eques.

Upon looking over Cramer, I observe, he had been under equal difficulties with myself; that he had added to the Equites, Panope, Diffimilis, and some others, as I have done; from the Achivi he had selected many, and formed a new division called Argonauts, which seems composed of such as truly belong to the Nymphales, and have been placed with the Achivi, apparently only for their size and beauty. Describing Xiphares (which Mr. Fabricius has placed with the Achivi), he says “Selon la division de Mr. Linnæus celui-ci, comme le Pap. Jason, Pyrrhus, & plusieurs autres qui les ressemblent, appartiendroient aux Chevaliers Grecs: mais le caractère distinctif & susmentionné des pattes, les font ranger, selon moi, dans une autre, ou dans une famille particulière des Papillons diurnes.”

HELICONII. Wings narrow, entire, often naked or deprived of scales; the upper wings long, the inferior short—

Add,

with a connecting nerve in the centre; very slightly grooved, to admit the abdomen, which is in general long, as are also the antennæ.

DANAI. Wings entire—

Add,

the under with a connecting nerve in the centre, and a deep abdominal groove; palpi projected.

As I before remarked under the Equites, that the Troes had each of them the character assigned to the Equites, it was necessary the Achivi should have the same. So in the Danai Candidi, as every specimen described by Linnæus has the same character, *viz.* the connecting nerve, it is necessary also that the Danai Festivi should have the same.

NYMPHALES. Wings denticulated—

Add,

the under without a connecting nerve in the centre, and with a deep abdominal groove, palpi projected.

N. B. The terms of *subintegerrimus* to some of the Danai, and *subdentatus* to some of the Nymphales, approach so near as to confound the one family with the other; but the connecting nerve in the centre of the wing is a certain distinguishing character between the Danai and Nymphales.

PLEBEII. Small.

Rurales—Spots on the wings obscure.

Urbicolæ—Spots on the wings for the most part transparent.

As

As size can be no distinction to form a character, each family being of various dimensions, it is necessary to point out a character which others do not partake of, and which may easily be done, having even been noticed by Mr. Yeats in his Institutions of Entomology, p. 132, yet altogether not quite sufficiently—his words are as follows:

“ The family of the Plebeii is very inaccurate, and contains insects very different from one another, at the same time that they resemble, and have all the characters of some or other of the preceding ones, under which many of them, I think, might be properly arranged. The remaining Plebeii would compose a family very distinct from all the others, and which might be formed into two sections; the first containing small butterflies, having long and flexible or weak tails, slender bodies, and clubbed antennæ, as Cupido, Marfyas, Boeticus, &c. the other distinguished by the shortness, thickness, or breadth of their head, thorax and abdomen, and by the shape of their upper wings, which in these last are pointed at their extremity, and long in proportion to their width, as the Proteus, Phidias, &c.

“ The antennæ in this last division are generally uncinated or crooked at their extremity; some of them have likewise tails, but these are very broad and strong, and are always ciliated, or edged with a fringe of hairs, as in the Proteus, &c.”

They may therefore be thus divided:

PLEBEII *Rurales*—Thorax and abdomen slender; under wings without a connecting nerve; antennæ clubbed.
—with long, weak, flexible tails.
—without tails, wings entire.

PLEBEII *Urbicolæ*—Thorax and abdomen short, thick, or broad; under wings without a connecting nerve; antennæ uncinated or crooked at the extremity.

—with upper wings pointed at the extremity, and long in proportion to their width.

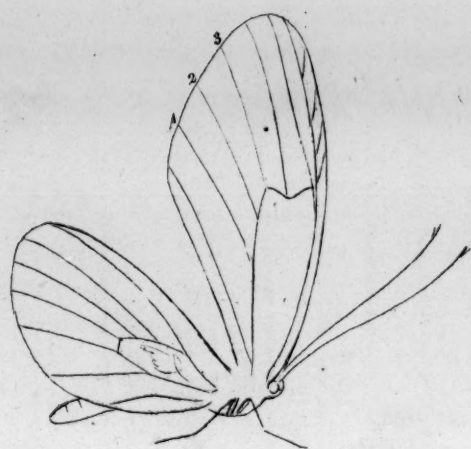
—upper wings less extended, and together with their under wings more rotund, with their margins entire.

Thus far nearly agreeable to Linnæus; yet there remain a few that cannot (if the foregoing directions are strictly attended to) be ranked with any division before mentioned,; for which it is necessary to invent a new term, and to arrange separately, immediately after the Equites, as partaking more of that division than any other. I therefore call them.

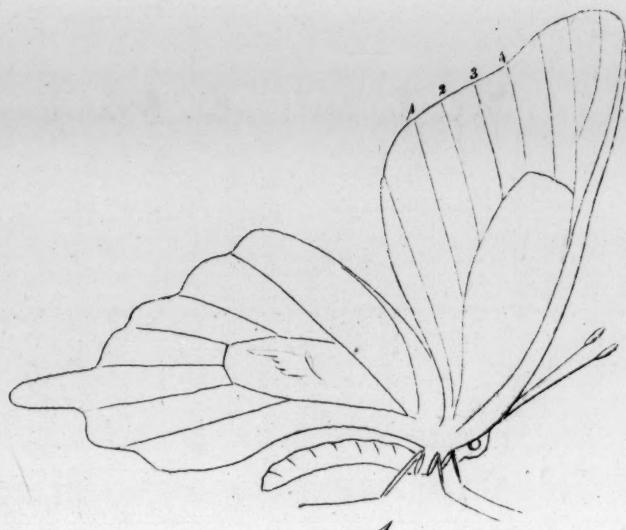
ROMANI.

By so doing I take from the Equites all that have filiform antennæ. Their characters stand thus: Size in general large, without an abdominal groove; no connecting nerve; their antennæ generally acuminate; the veins of both upper and under wings going from their root to the extremity, nearly in straight lines. To this division I bring from Linnæus's Equites, *Leilus*, *Orontes*, and *Patroclus*; and from Fabricius's *Danai Festivi*—*Licas*, *Syphax*, *Evalthe*, and *Cochrus*, and a few others not yet described. These few remarks can leave no doubt to what division any *Papilio* should be referred. The connecting nerve is the most important character of all.

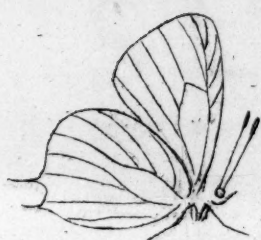




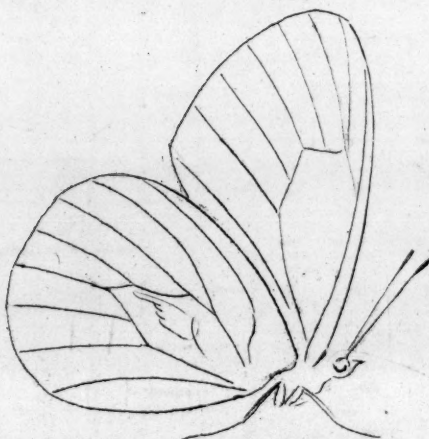
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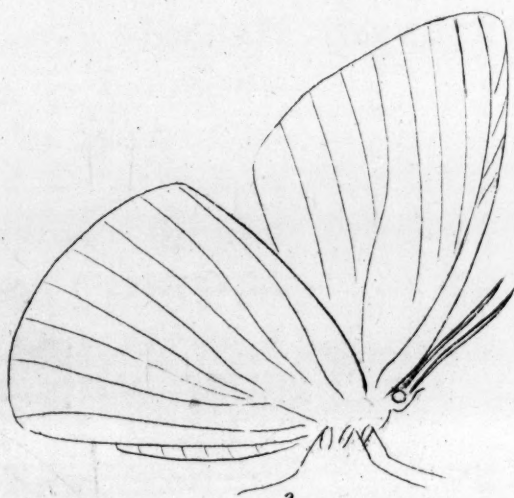
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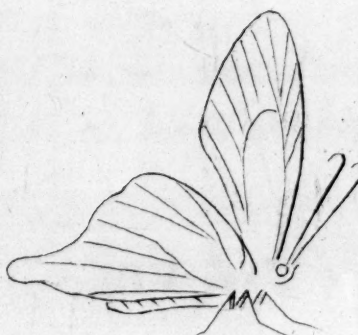
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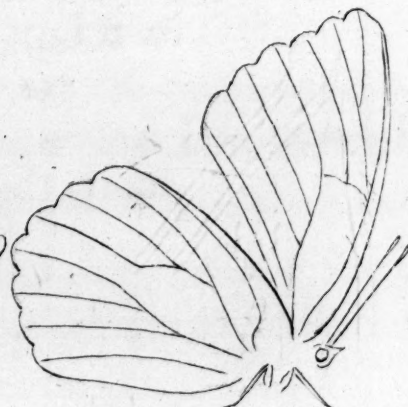
7



9



8



5

		Equites, fig. 1.	Romani, fig. 2.	Heliconii, fig. 3.	Danai, fig. 4.	Nymphales, fig. 5.	Plebei rurales, fig. 6, 7.	Plebei urbicolæ, fig. 8, 9.
ANTENNÆ	clubbed - - -							
	uncinated or crooked							
	acuminated or filiform							
PALPI	projected - - -							
	a brush - - -							
ALÆ	superiores 3 nerves - -							
	4 nerves - - -							
	nerves nearly in straight lines - . -							
ALÆ	inferiores, with a groove							
	slightly grooved - -							
	no groove - - -							
	with a connecting nerve							
	without a connecting nerve - - -							
THORAX and ABDOMEN	slender - -							
	short, thick or broad -							

See TAB. VIII.

IX. Descrip-

IX. *Descriptions of several Species of Pancratium.* - By Richard Anthony Salisbury, Esq. F. L. S.

Read Nov. 1, 1791.

S EX Pancratii species apud nostrates cultas, non solummodo ab auctoribus invenio confusas, verum enimvero earum characteres communes in differentiâ specificâ adductos; quas ergo iterum adumbrare necnon paulo fusius describere, operæ pretium videtur.

Maritimum. Tab. 9.

1. P. foliis linearibus glaucis: corollæ tubo cylindræo, *superne angulato*; laciniis tubo brevioribus, patenti-recurvis, lineari-lanceolatis, basi *coronæ adnatis*: coronæ sinibus *grosse 2-dentatis*.

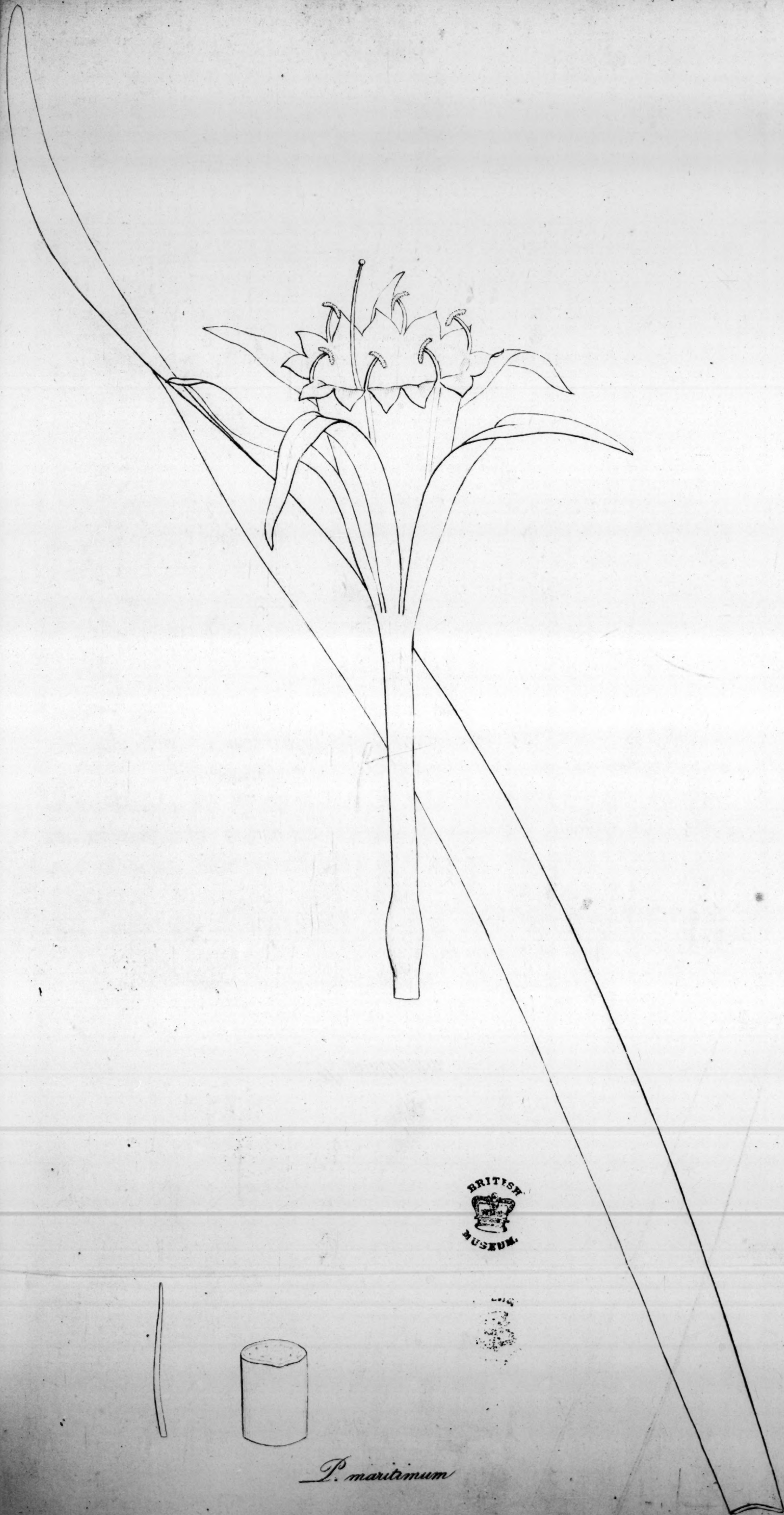
Pancratium maritimum. *Cav. Ic. v. i. p. 41. f. 56. mala.* Pancratium verecundum. *Soland. in Ait. Hort. Kew. v. i. p. 412.* Pancratium maritimum. *Linn. Sp. pl. ed. 2. p. 418.* Pancratium carolinianum. *Linn. Sp. pl. ed. 2. p. 418.* Lilio-narcissus polyanthos, &c. *Catesb. Hist. Carol. v. 2. append. p. 5. t. 5.* Hemerocallis valentina. *Clus. Hist. pl. lib. 2. p. 167. cum Ic.*

Sponte nascentem infra *Montpellier* littoribus arenosis abunde legi anno 1786.

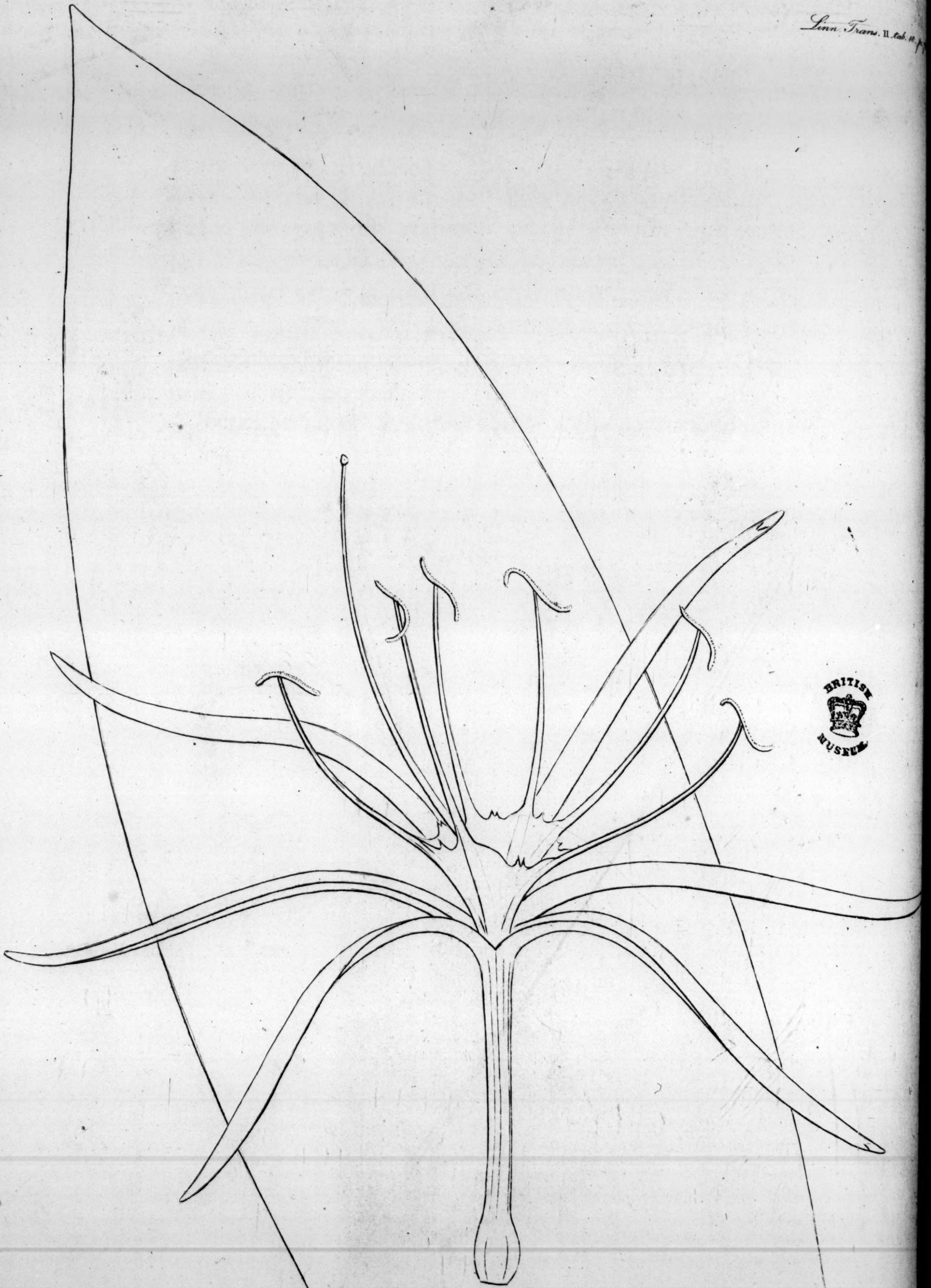
Floret fine *Julii, Augusto.*

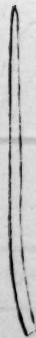
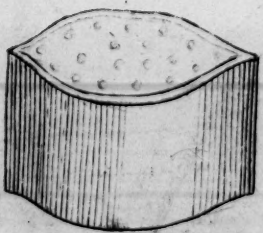
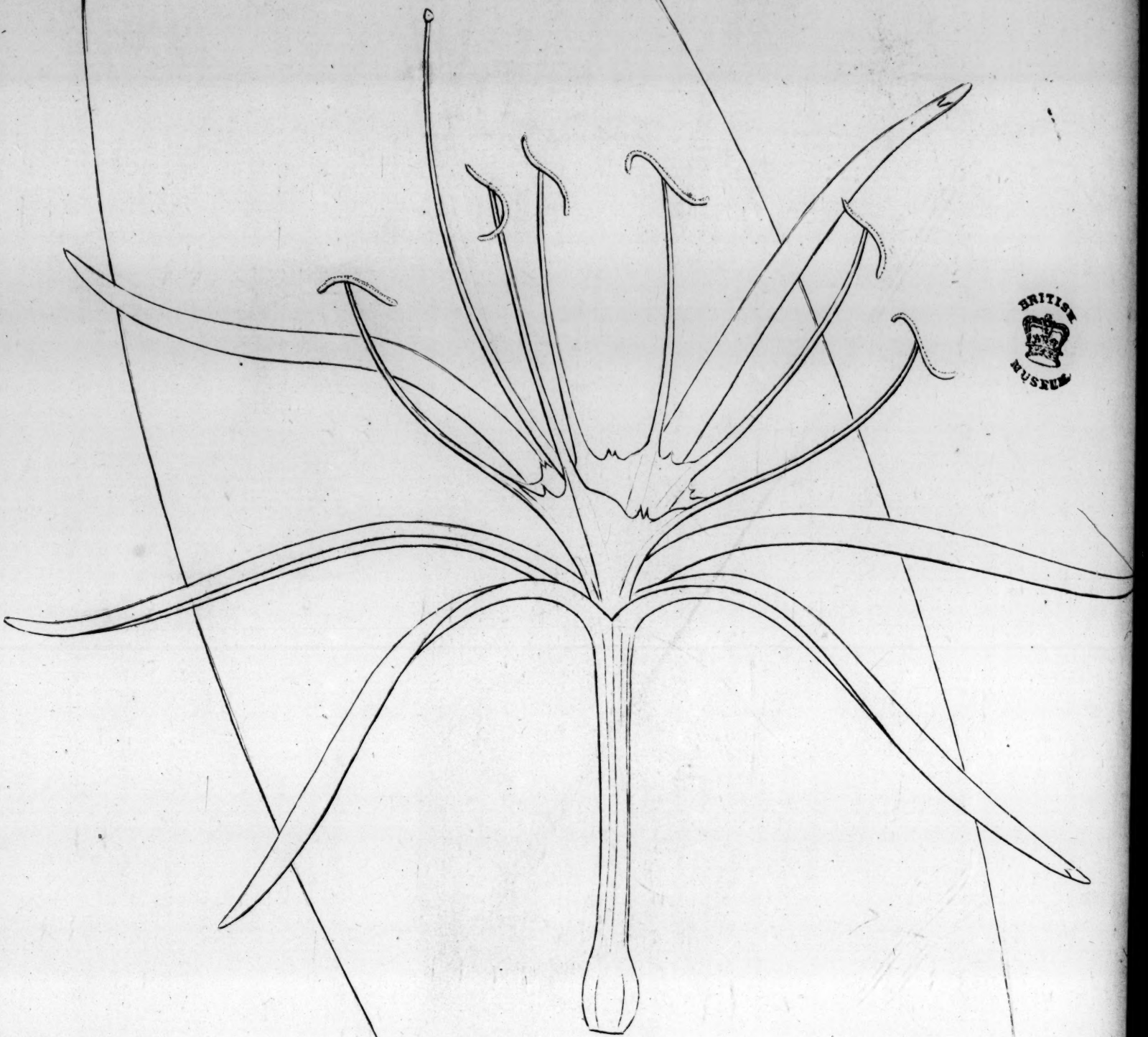
Planta $1\frac{1}{2}$ -pedalis. Folia 6 vel 7, 2-faria, basi ipsâ vaginantia, erecto-patentia, plus minus tortuosa, linearia, integerrima, obtusa,

Anna Maria, 1841, 9/11



P. maritimum





P. amœnum

utrinque glabra cum rore aliquo, paululum striata, planiuscula, car-
nosa. Flores suaveolentes. Fasciculus 6-10-florus. Pedunculus 1,
dilute glaucus, ab uno latere inter folia radicalis, erectus, com-
pressus, obtusus nec anceps, lævis. Bractæe congenerum. Ger-
men pedicellatum, ovale, 3-gonum. Corolla—Tubus dilute viridis,
cylindræus, superne unguatus—Limbus niveus, tubo paulo bre-
vior, patenti-recurvus: Laciniæ disco usque ad medium coronæ ad-
natæ, lateribus inferne reflexis, lineari-lanceolatæ, integerrimæ, ob-
tusè mucronatæ—Corona (Nectarium Linn.) nivea, limbo paulo
brevior, infundibuliformis, apice patula, sinubus grosse 2-dentata—
lævis, marcescens. Filamenta brevissima, vix dentibus coronæ al-
tiora, incurva, subulata.

Cultum rarissime floret: iconem nostram sub sole ardente incom-
mode delineavi; plerasque notas fideliter exhibet, attamen rudis est,
& parum admodum mihi placens.

Amænum. Tab. 10.

2. P. foliis lanceolatis, glabris: corollæ tubo teretiusculo *dense*
striato; laciniis tubo longioribus, recurvis, linearibus, *æqualiter conca-*
vis: coronæ sinubus *ligulâ 2-fidâ*.

Pancratium excisum. *Linn. fil. MSS.* Pancratium declinatum.
Jacq. Hort. Vind. v. 3. p. 11. t. 10. Narcissus americanus, &c. *Com-*
mel. Hort. Amst. v. 2. p. 173. t. 87.

In *Guiana* forte spontaneum.

Floret bis anno, cito post *æquinoctia*.

Planta 2-pedalis. Folia 9—12, viridia, 2-faria, basi ipsâ vaginan-
tia, recurva, lanceolata, integerrima, obtusiuscula, utrinque glabra
tenue striata, canaliculata, basi carinata, carnosæ. Flores fragrantæ.
Fasciculus 10-15-florus. Pedunculus 1, dilute glaucus, inter folia
interiora, quibus paulo brevior, radicalis, primo erectus, post flo-
rescentiam deflexus, valde compressus ancepsque, glaber cum rore,
stri-

striatulus, solidus. Bractææ congenerum. Germen læte viride, sessile, ovale, 3-gonum, glabrum. Corolla—Tubus dilute viridis, $2\frac{1}{2}$ -pollicaris, teretiusculus, dense striatus—Limbus niveus, tubo $\frac{1}{3}$ longior, recurvus: Lacinia subæquales, lineares, integerrimæ, obtuse mucronatæ, expansione æqualiter concavæ, lateribus baseos paululum conduplicatæ—Corona nivea, limbo paulo plus quam $\frac{3}{4}$ brevior, infundibuliformis, basi tubo contractior, sinubus in ligulam sæpius 2-fidam producta, rugosula, tenuis, lævis, marcescens. Filamenta coronâ bis altiora.

Cum plures species pedunculo in fructu æque declinato gaudent, nomen Jacquinianum non retinui.

Fragrans. Tab. 11.

3. P. foliorum petiolis *latis*: corollæ tubo 6-angulo, *estriato*; laciniiis tubo longioribus, *recurvis*, linearibus, alternis concavioribus: coronæ sinubus repando-emarginatis.

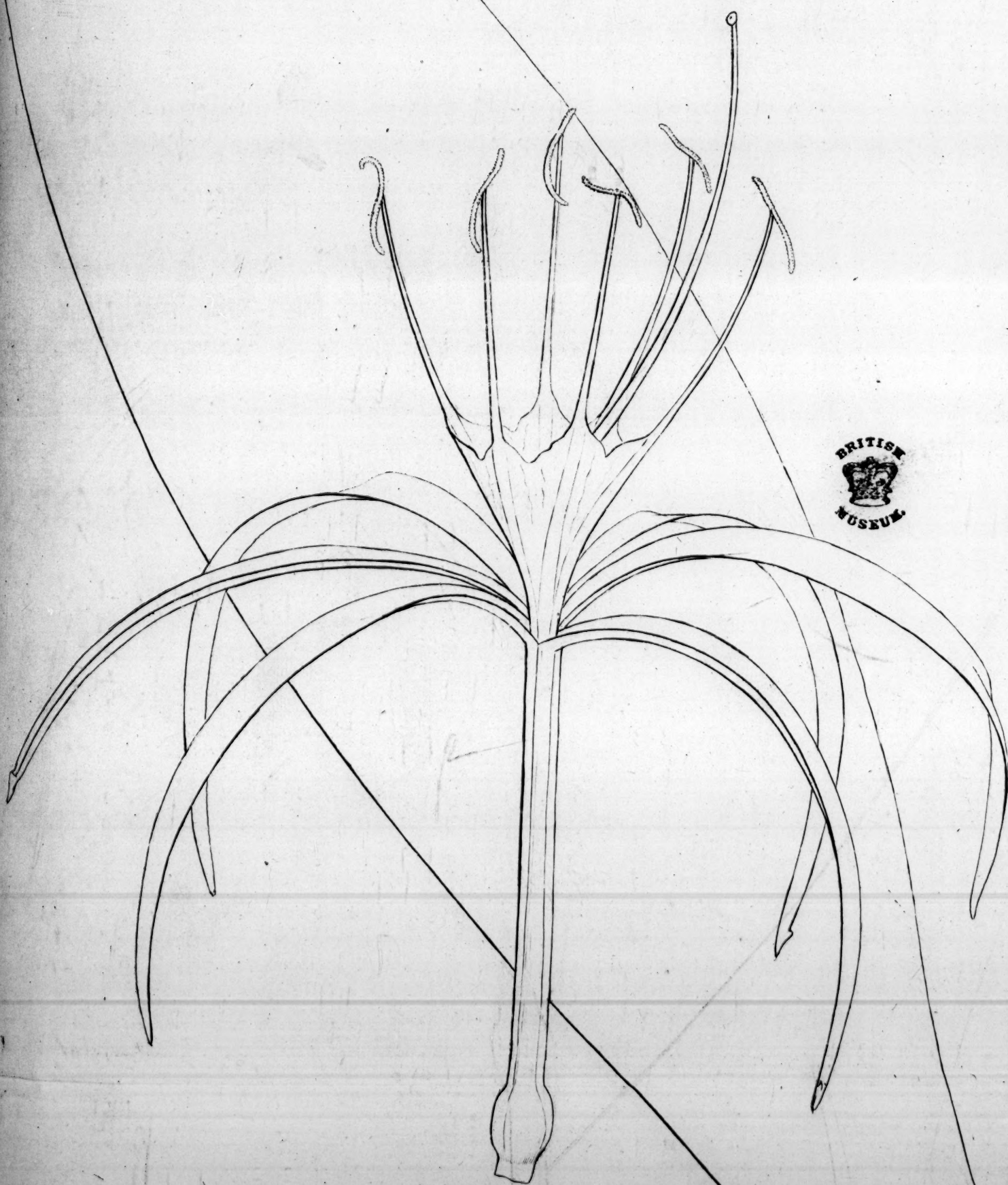
Narcissus totus albus latifolius, &c. *Mart. Decad. p. 27. cum Ic.?*

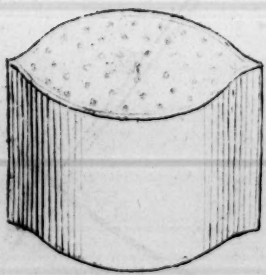
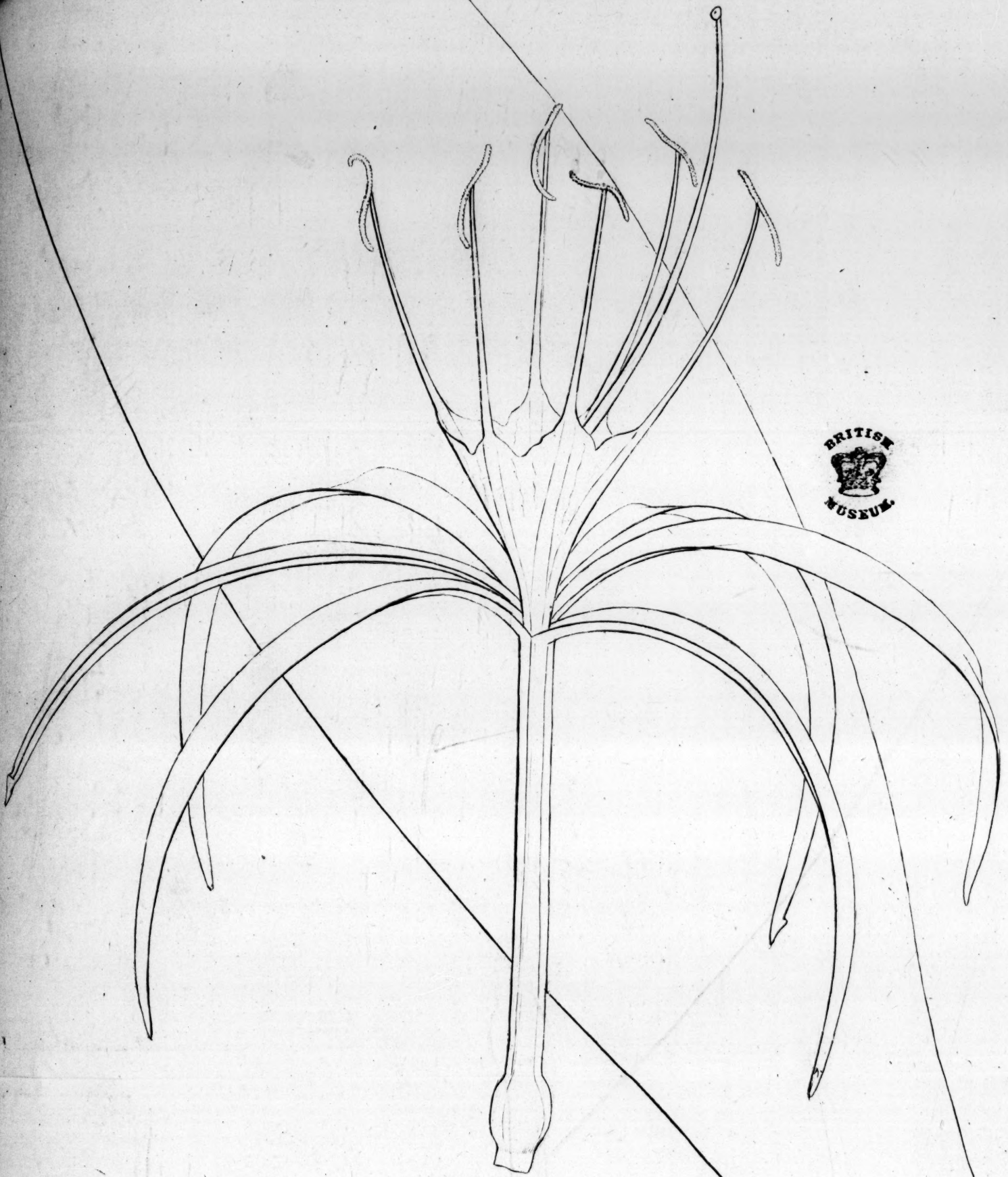
Narcissus totus albus latifolius, &c. *Sloan. Hist. Jam. v. 1. p. 244?*

Ex Inf. *Barbadoes* sæpius accepi.

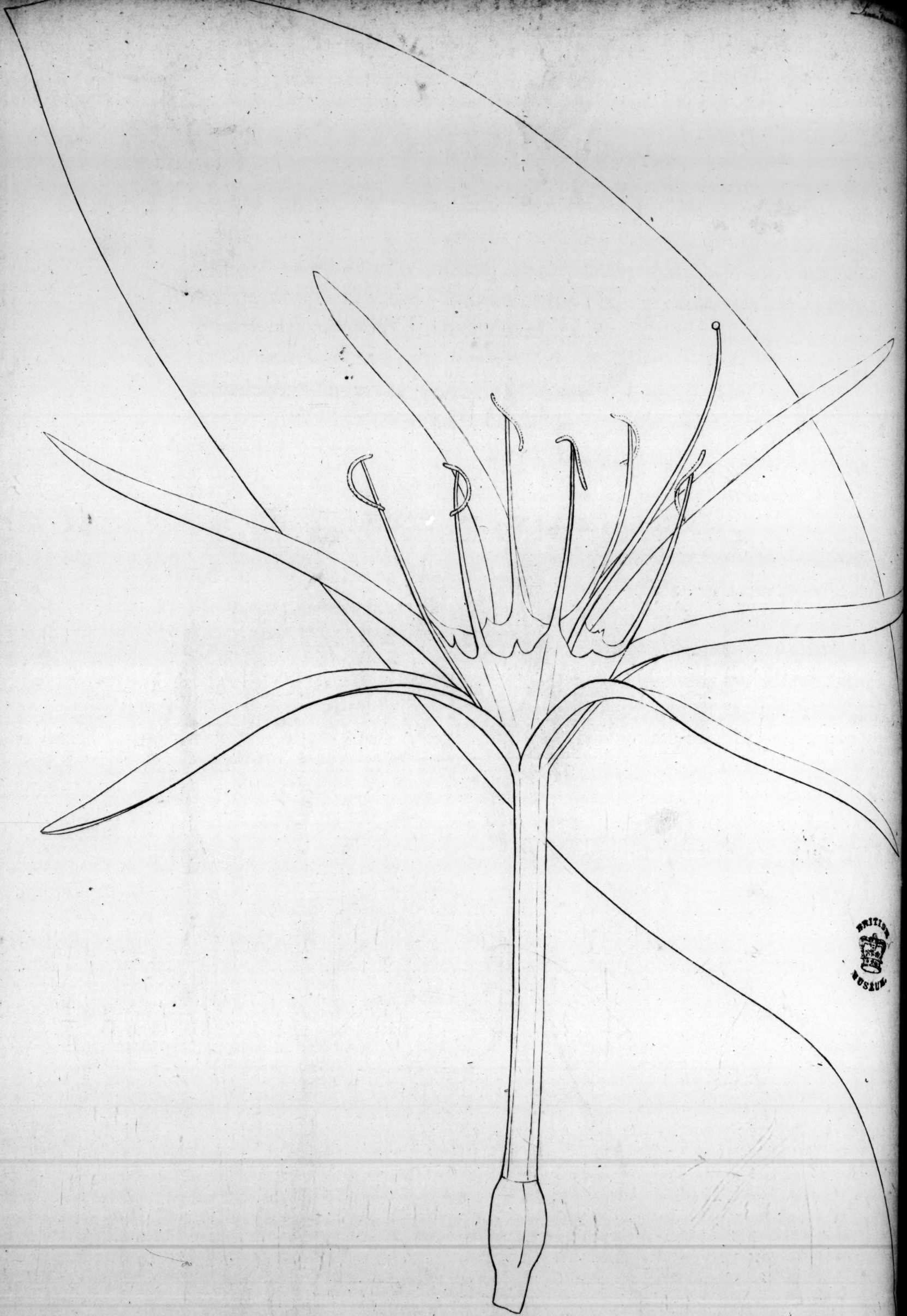
Floret circa *æquinoctia*.

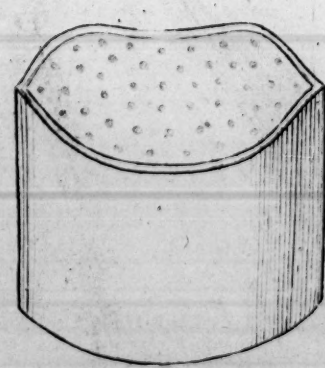
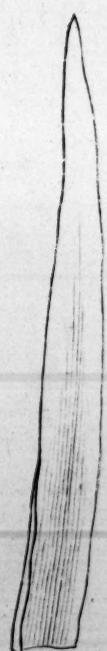
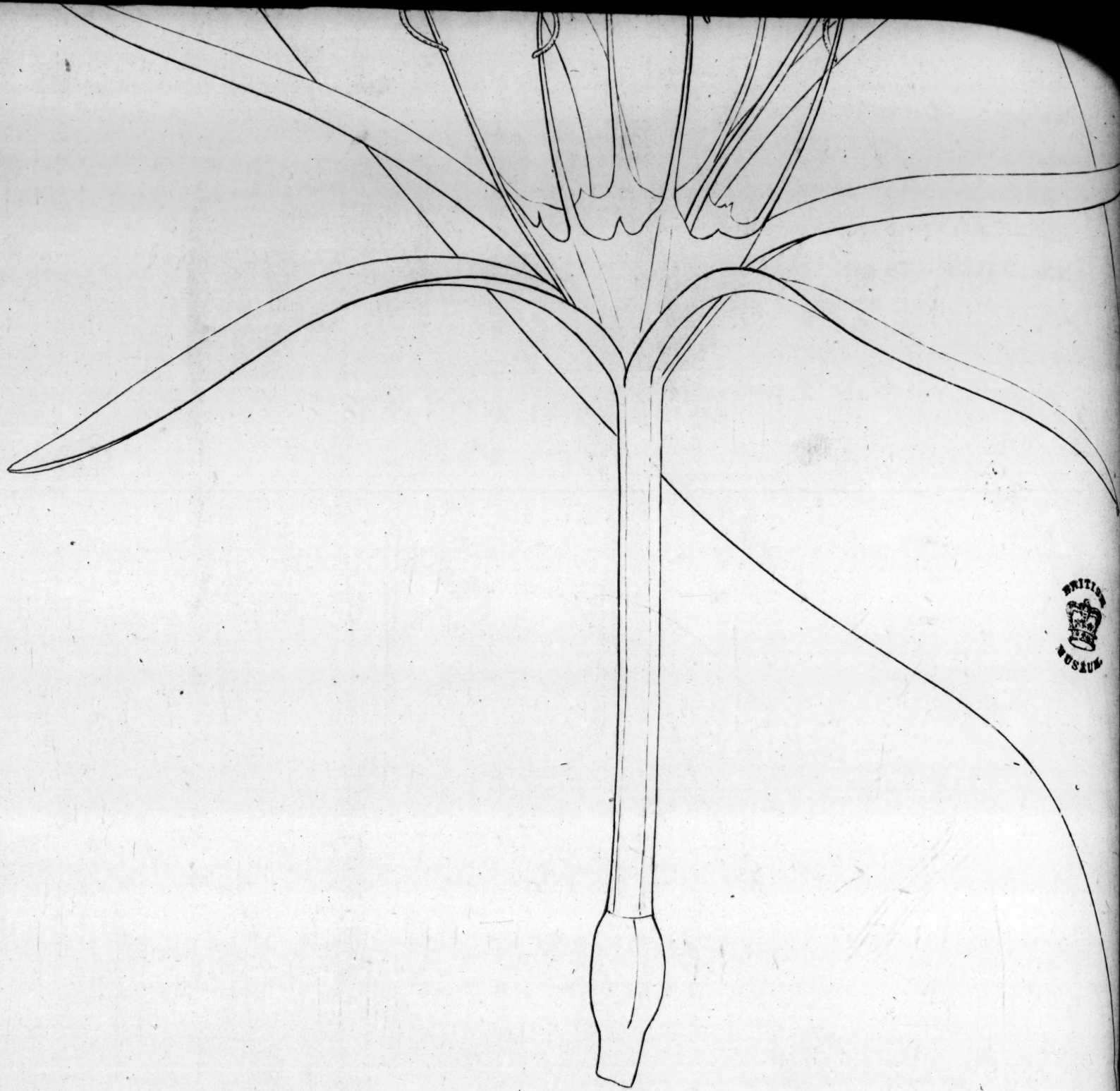
Planta $1\frac{1}{2}$ -pedalis. Folia 7—10, viridia, 2-faria—Petioli lati, basi vaginantes, patentes, semiteretes—Lamina petiolis multo longiores, recurvæ, lanceolatæ, integerrimæ, obtusæ, paululum canaliculatæ—glabra potissimum supra, carnosæ. Flores valde fragrantæ. Fasciculus 7-12-florus. Pedunculus 1, dilute glaucus, inter folia interiora, quibus paulo brevior, radicalis, post florescentiam versus terram deflexus, compressus, anceps, glaber cum rore, striatulus, solidus. Bractææ congenerum. Germen læte viride, breve pedicellatum, ovale, 3-gonum, glabrum cum rore. Corolla—Tubus dilutissime viridis, $2\frac{1}{2}$ -pollicaris, 6-angulus angulis alternis angustioribus, non striatus ut in aliis—Limbus niveus, tubo $\frac{1}{4}$ longior, recurvus: Lacinia lineares,





P. fragrans





P. speciosum.

lineares, integerrimæ, obtuse mucronatæ, exteriores parum angustiores et multo concaviores—Corona nivea, limbo $\frac{2}{3}$ brevior, infundibuliformis, basi tubo contractior, sinubus repando-emarginata, quandoque attamen in ligulam 2-fidam producta more præcedentis, rugosula, tenuis—lævis, marcescens. Filamenta coronæ $\frac{1}{4}$ altiora.

Ex synonymis citatis dubiis, et Commeliniano quod antecedentis, suum *Pancratium caribæum* proposuit Linné.

Speciosum. Tab. 12.

4. *P. foliorum* petiolis *angustis*: corollæ tubo 3-angulo *rare striato*; laciniis tubo longioribus, *patenti-recurvulis*, linearibus, alternis *conca-*
vioribus; coronæ sinubus *ligulâ 2-fidâ*.

Pancratium speciosum. Linn. *fil. MSS.*

Floruit hætenus in nostro caldario tantum mense *Octobris*.

Planta $1\frac{1}{2}$ -pedalis. Folia 9—12, viridia, 2-faria—Petioli angusti, basi dilatatâ vaginantes, recurvi, lineares, femiteretes, supra plani—Laminæ petiolis 3-plo longiores, recurvæ, lanceolatæ, integerrimæ, obtusæ, striatæ, concaviusculæ, versus basin carinatæ—supra glabra, subtus lævia, carnosæ. Flores fragrantæ. Fasciculus 11—15-florus, densus. Pedunculus 1, dilute viridis, inter folia inferiora quibus paulo brevior radicalis, multo latior quam in aliis, sub florescentiâ erectus, postea declinatus, compressus, altero latere planiore, anceps, glaber, tenuissime striatulus, solidus. Bractææ interiores valde latæ, cæterum congenerum. Germen pedicellatum, subovale, 3-angulum, glabrum. Corolla—Tubus 3-pollicaris, cylindræus, 3-angulus, *rare striatus*, melle inundatus—Limbus niveus, tubo $\frac{1}{2}$ longior, *patenti recurvulus*: Laciniæ latitudine subæquales, lineares, integerrimæ, exteriores longiores & concaviores, magisque mucronatæ—Corona nivea, limbo $2\frac{1}{2}$ brevior, infundibuliformis, basi tubo contractior, medio sinuum in ligulam cuneiformem sæpius 2-fidam producta, rugosula, tenuis—lævis, marcescens. Filamenta coronæ $1\frac{1}{6}$ altiora.

Dignoscas primo intuitu latitudine bractearum interiorum.

Littorale. Tab. 13.

5. P. foliis lineari-lanceolatis, glabris: corolla tubo 3-angulo, 7-8-pollicari; laciniis tubo brevioribus, basi coronæ adnatis, recurvis, linearibus; coronæ sinubus repandis.

Pancratium littorale. Jacq. Hort. Vind. v. 3. p. 41. t. 75. bona.
Pancratium littorale. Jacq. Hist. Amer. p. 99. t. 179. f. 94. Pancratium foliis ensiformibus, &c. Trew Pl. Select. p. 6. t. 27. bona.

Sponte nascentem in Inf. *Tierra Bomba*, littoribus arenosis copiose legit Nic. Jos. Jacquin.

Floret Octobri, Novembri.

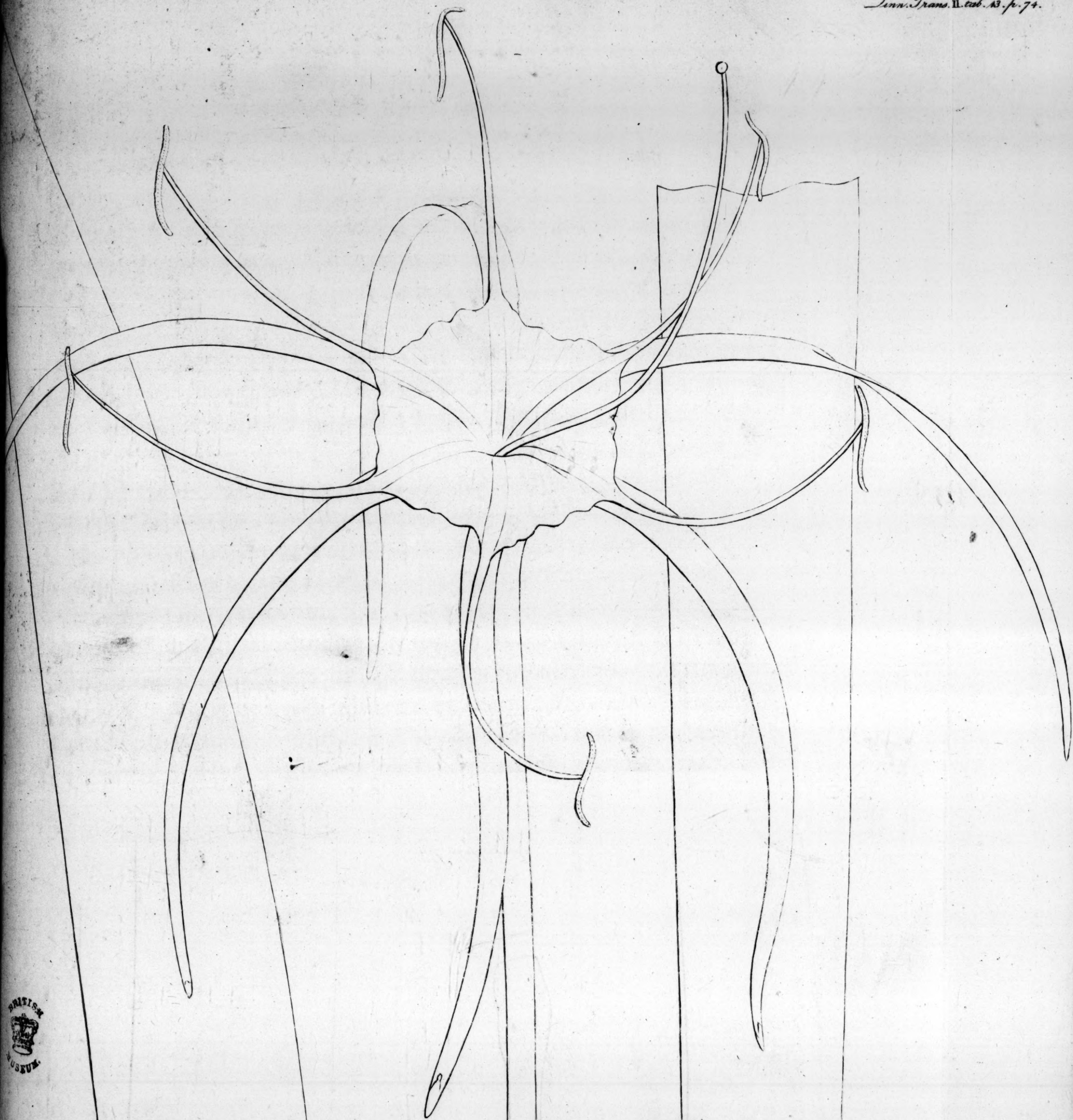
Planta 3-pedalis vel plus. Folia 9-12, bifaria, basi ipsâ vaginantia, erecto-recurva, lineari-lanceolata, integerrima, obtusiuscula, utrinque glabra, convexa, versus basin carinata, carnosa. Flores fragrantés. Fasciculus 7-10-florus. Pedunculus 1, dilute glaucus, inter folia inferiora quibus paulo brevior radicalis, sub florescentiâ erectus, postea declinatus, compressus, anceps, glaber cum rore cæsius, striatus, solidus. Bractææ congenerum. Germen sessile, oblongum, 3-gonum, glabrum. Corolla—Tubus dilute viridis, 7-8-pollicaris, obsolete 3-gonus, striatulus—Limbus niveus, tubo $\frac{1}{3}$ brevior, recurvus: Laciniæ subæquales, lineares, integerrimæ, obtuse mucronatæ, basi coronæ adnatæ, concavæ—Corona nivea, limbo $\frac{2}{3}$ brevior, infundibuliformis, basi circiter diametro tubi, apice late patens, sinubus repanda vel erosa, rugosula, tenuis—lævis, marcescens. Filamenta coronâ $1\frac{1}{4}$ altiora.

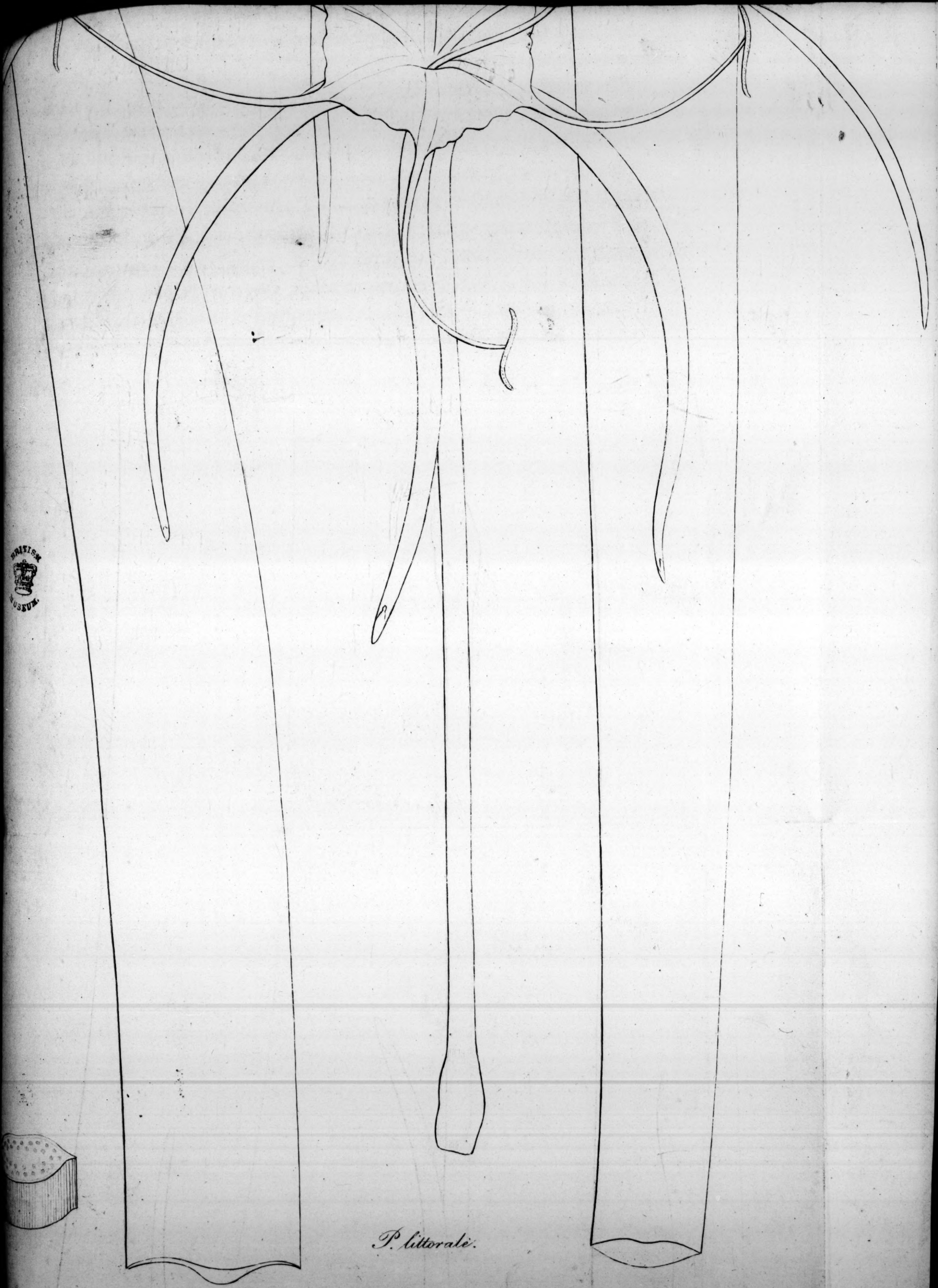
In *Sp. Pl.* cum sequente mixtum: hinc et quibusdam *Pancratium illyricum* male audit.

Stellare. Tab. 14.

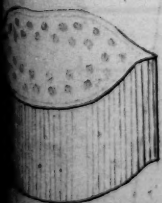
6. P. foliis spatulæformibus glaucis: corollæ tubo 3-angulo; laciniis tubo longioribus, patentissimis, lanceolatis: coronæ sinubus profunde 2-fidis, in stellam patentissimis.

Pan-

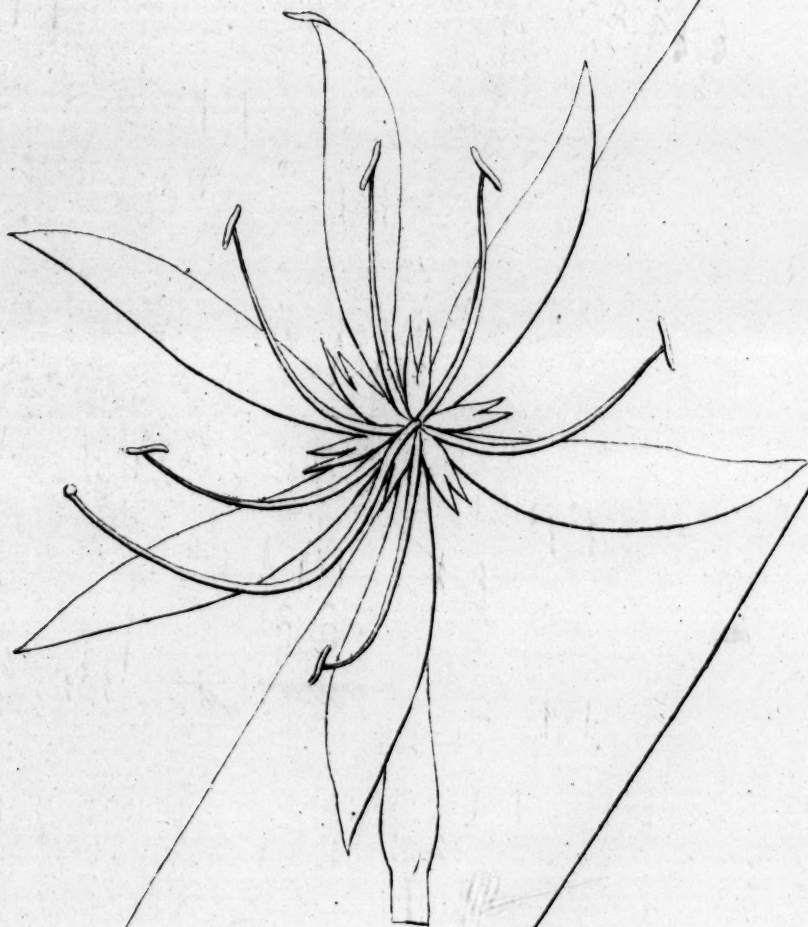


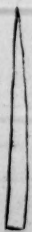
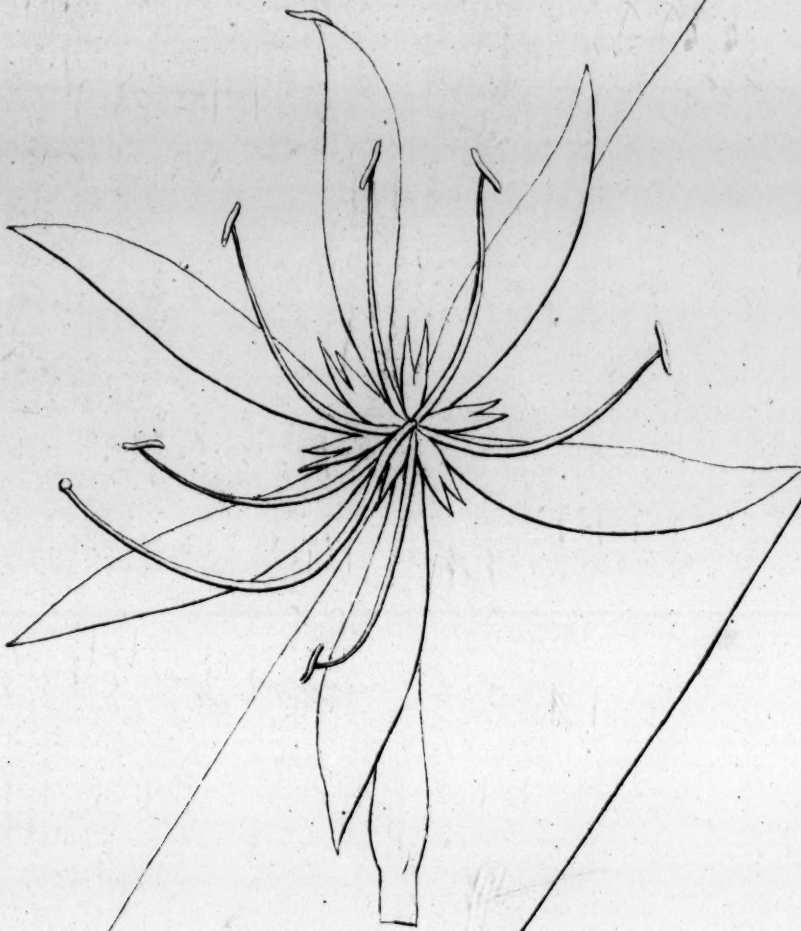


BRITISH
MUSEUM



P. littorale.





P. stellare

Pancratium illyricum. *Linn. Sp. Pl. ed. 2. p. 418.* *Pancratium spatha multiflora, &c. Ph. Mill. Ic. v. 2. p. 32. t. 97.* *Narcissus illyricus liliaceus. Seb. Thes. v. 1. p. 17. t. 8. f. 1.* *Lilio-narcissus Hemerocallidis valentinæ facie. Clus. Hist. Pl. lib. 2. p. 167. cum Ic.*

Sponte nascitur prope *Rockelle* littoribus arenosis secundum *Morison*.

Foliatur *Aprili*.

Floret *Junio*.

Defoliatur fine *Augusti*.

Planta pedalis vel plus. Folia sæpius 6, glauca, 2-faria, basi infra terram vaginantia, erecto-recurva, anguste spatulæformia, integerrima, obtusa, glabra cum røre, tenuissime striata, concava, fucculentula. Flores suaveolentes. Fasciculus 7-15-florus. Pedunculus pallide glaucus, inter folia ab uno latere radicalis, solitarius, quandoque ex diversâ axillâ alter, erectus, admodum compressus et anceps, in fructu declinatus. Germen pedicellatum, ovale, 3-angulum. Bractææ congenerum. Corolla—Tubus dilute viridis, 3-angulus—Limbus albus, tubo longior, patentissimus: Lacinia lanceolata, planiusculæ, interiores angustiores—Corona alba fundo flavescente, in stellam pulchre expansa, basi tubo contractior, limbo multo brevior, sinibus profunde 2-fida—lævis, marcescens. Filamenta coronâ circiter duplo altiora.

Sub dio læte viget et floret.

X. *Some Account of the Musca Pumilionis of Gmelin's Edition of the Syst. Naturæ. By William Markwick, Esq. F. L. S. With additional Remarks by T. Marsham, Esq. Sec. L. S.*

Read Nov. 1, 1791.

EARLY in the course of the last spring some fields of wheat in the neighbourhood of Battle appearing to be much blighted, a friend of mine discovered it to be caused by a small insect of the grub or caterpillar kind, lodged in the centre or very heart of the stem, just above the root. About the latter end of March I procured some of the wheat, examined it, and found in most of it a small larva or caterpillar alive; but in some it was already changed into the chrysalis state.

Being exceedingly anxious to determine the species of this apparently destructive animal, I planted some of the diseased roots in my garden under a hand glass, where they flourished very much, and threw out strong shoots on each side (the middle shoot withered); but whether the flies escaped through some hole in the glass, or whether they were devoured by a colony of ants which made their nest under the glass, I cannot tell, as I did not succeed in this attempt; for when I pulled up the wheat and examined it, there was an empty chrysalis in each plant. However, I had better luck in my next attempt: I placed several of the diseased roots of the wheat in a small flower-pot filled with bran, and covered it over close with gauze, in such a manner that no insect could get in from

the

the outside, nor could any escape from within. On the 14th of May three small flies were discovered sitting on the inside of the gauze. [See tab. 15. fig. d, D.] A few days after three more of the same flies appeared; there were in the flower-pot of bran six roots of diseased wheat, which produced six flies: on examining the roots afterwards, I found an empty shell of the chrysalis in each, so that I think there can be no doubt of the identity of the insect in question.

I mentioned that the larva and chrysalis were always found deposited on the principal stem just above the root. This stem it invariably destroyed, which gave the crop a most disastrous appearance, so that there was scarcely a hope of any produce: but after the larva had changed into its chrysalis state the mischief ceased, and the root was not so materially injured as to prevent its throwing out fresh shoots on each side, or stocking itself as the farmers term it; as I experienced by those which I planted in my garden.

In short, at harvest time I was most agreeably surprised to find a good crop of wheat, and the ears large and fine throughout the whole field. My friend thinks it the best crop on his farm, and supposes he shall have about three quarters and a half of threshed corn from each acre.

I hope some other gentlemen of the Linnean Society have had opportunities of making their observations upon this subject. I do not pretend to any very great skill in Entomology; I only relate facts, and have endeavoured to be very accurate in stating them.

During my observations upon this insect, a variety of thoughts suggested themselves to my mind. It was hinted to me, that possibly this was what has been called the Hessian fly, whose depredations in America have been so notorious. If so, a little good English husbandry, by keeping the ground in heart, and thus enabling the wounded shoots to repair themselves by strong lateral ones, prevents our being alarmed to so great a degree. I had my doubts how and what

what time the egg of the caterpillar was introduced into the field. It was imagined it might have been carried on in the manure; but the only manure applied to this field was lime, and I do not understand that to be the receptaculum of any of the genus of musca. The kind of wheat sown was a white wheat, lately introduced here from Surry: my friend could not recollect with certainty its name, but thought it was called white Zealand wheat. None but what was sown early, about the latter end of September, or the beginning of October, was affected by this insect; and in one field, where a part of it was early sown with white, and the other with red wheat at the same time, the white wheat was much affected, and the red but very little. The reason why the early-sown wheat only was affected is, I should imagine, because the cold at the approach of winter destroyed the fly before the late-sown wheat was sprung out of the ground: consequently it could not lay its egg in that.

The soil is rather stiff with a gravelly bottom. I shall be very glad to meet with the observations of some other of our scientific friends. I can scarcely flatter myself that our investigation of this insect will be productive of so much benefit to the public, as to find out a remedy for the evil by destroying it effectually; but it is with some such view that I trouble the Society with these observations.

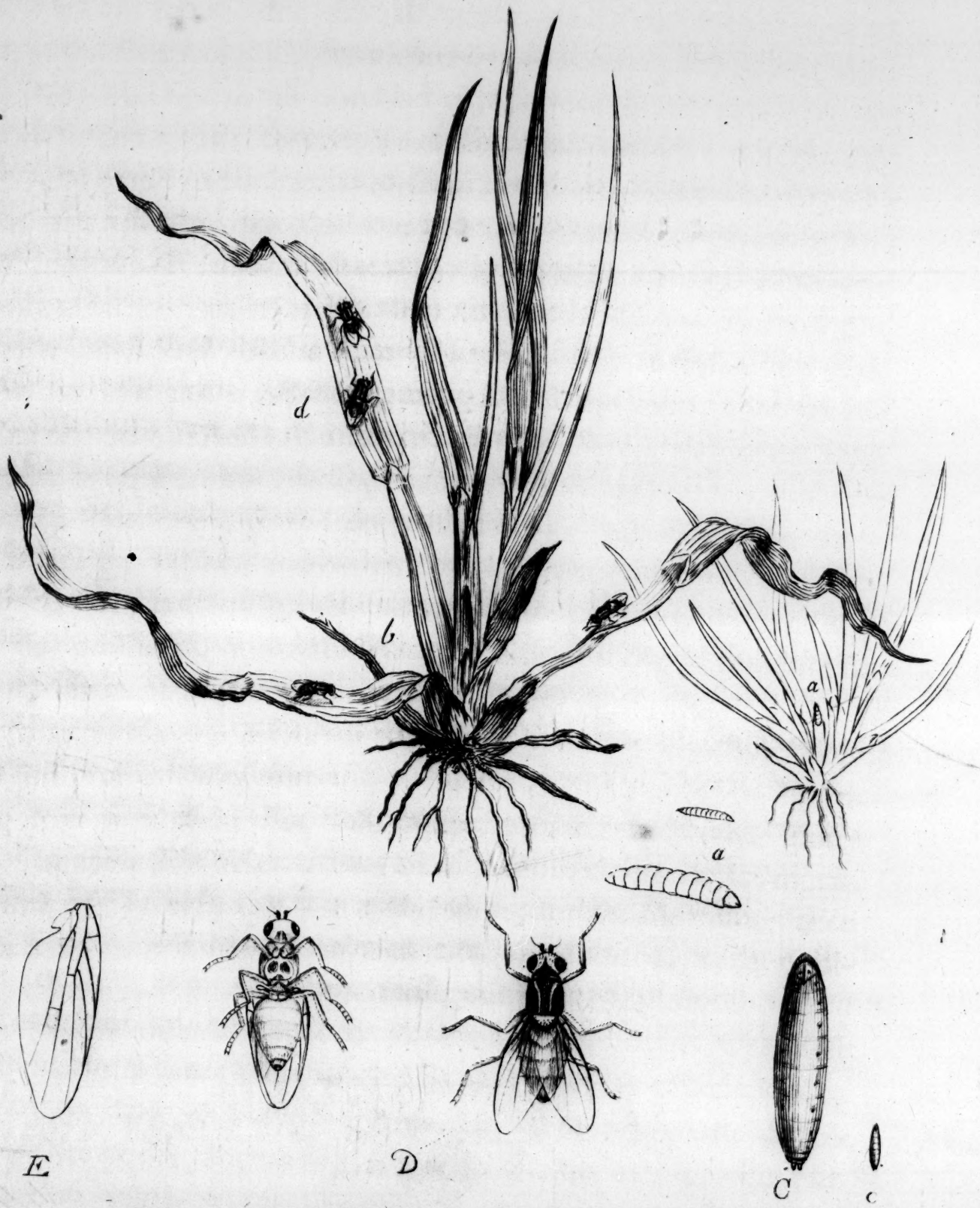
I have made as accurate a drawing as I was able of the insect in all its stages of growth, and the situation in which it is found in the principal shoot or stem of the plant.

CATSFIELD,
Aug. 29, 1791.

EXPLANATION of TAB. 15.

- a. The caterpillar of its natural size, as it is found in the centre of the green wheat just above the root.
- b. The pupa in the stem.
- c. The pupa of its natural size. C. the same magnified.
- d. The fly of its natural size. D. the same magnified.
- E. The wing magnified.

IN



Musca pumilionis.



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IN addition to the foregoing accurate and valuable observations of Mr. Markwick, it may not be improper to observe, that the larva of this fly was sent several months since, with some of the roots of wheat that were attacked, to Arthur Young, Esq. who being apprehensive that they were the larva of the Hessian fly, sent the roots of wheat to Sir Joseph Banks, enclosed in a glass phial, for his opinion. Upon examination, it was found that the insect was still in the stem or principal shoot of the plant, in its pupa state. These being carefully preserved, the fly appeared in a few days; and Sir Joseph Banks determined it to be the *Musca Pumilionis* of Gmelin's *Systema Naturæ*, and by letter communicated this information to Mr. Young, accompanied with an engraving of the fly, both of which were published in the 91st number of the *Annals of Agriculture*.

The following description of the fly is given by Gmelin, taken from the *Swedish Transactions*.

Musca Pumilionis—nigra, subtus, capite, thoracisque duabus lineis flavis, halteribus albis, pedibus cinereis apice nigris.

Habitat, larva, capite acuto apice nigro, in *Secalis culmis* adeo incremento eorum noxia, ut vix 1, 2, 3 pollicum altitudinem assequantur.

An account of this fly and its destructive properties was first published in the *Transactions of the Royal Academy of Sciences at Stockholm* for the year 1778, by Mr. Ol. Bjerkander, who discovered it on the young shoots of the rye in the month of May, at the lowermost joint, which stopped the growth of those shoots, and made them appear as dwarfs; which circumstance suggested the name *Pumilionis*. He describes the larva to be white, two lines in length, composed of 10 rings, the head pointed at the end,

end, black, and resembling a V. They passed into their pupa state the 25th of the same month. The pupa was yellow, shining, rather more than one line in length, and composed of rings.—The flies appeared the 12th of June and the following days; the perfect animal is well described above.

At what time these eggs are deposited in the rye, that gentleman observes, is not yet determined. The larvæ were small on the 23d April, and full grown the 25th May: on the sides of the stems were seen no holes, from whence he conjectures that the eggs or larvæ must enter at the top of the leaves. The fly, when hatched, forces its way upwards, and flies out of its nest.

The dwarf stems Mr. Bjerkander observed began to grow yellow and decay the 14th June, and were in such abundance, that in some fields, 8, 12, or 14, were found in a square of two feet; from whence he concludes that great injury is done to the rye, and strongly recommends that the stems should be pulled up and burnt, while the insect is in the larva or pupa state; and by this means he thinks one or two persons might destroy many thousands of them in a day, he himself having picked up 350 stems in a few hours.

It will certainly be a pleasing satisfaction to the public in general, and to the farmer in particular, to know, that this insect is not the Hessian fly of America; and also, from the careful experiments of Mr. Markwick, to find that its destructive properties are not of that magnitude as were at first apprehended, or as Mr. Bjerkander supposed; though perhaps an increase of the fly may render it a formidable enemy. It is therefore much to be wished, that such gentlemen as have leisure and opportunity would pay some attention to this subject, and, with Mr. Markwick, pursue his experiments with a view to discover all the particular properties and natural œconomy of this animal. Now, as this fly is bred here so early as May, it is probable there is more than one brood in the year; for having been favoured with two or three of the flies by Sir Joseph Banks,

Banks, I find that they are not uncommon, having frequently found them in autumn on umbelliferous plants; and insects of this order seldom live so long in their perfect state, and are rarely seen abroad so late in the year as the latter end of October: indeed, if there are two breeds in the year, a question will arise, upon what plant is the second brood nourished? for wheat sown the latter end of September, or the beginning of October, must be some time before it appears above ground. And yet I cannot believe that the egg is carried there either by manure or by any other means than by the parent fly, from this singular property, that only one larva is found on each plant, and that always in the principal stem; for although the Muscæ in general deposit a number of eggs in one spot, it is always where plenty of food is at hand to nourish the young larvæ immediately on their being hatched. I am therefore desirous to offer the following hints for observation, hoping that some gentleman will take up the subject, and examine it still more closely. When it appears evident that a fly has attacked a field of wheat, rye, &c. watch carefully the animal through all its stages, but more especially when the fly takes wing, observing on what plants it settles, and whether it is partial to any particular plant; and if this can be determined with precision, attend to see it deposit its eggs, carefully examining whether it lays more than one at a time. If afterwards the larvæ appear on those plants, observe in what manner they feed, continuing the remarks till the perfect insect appears, when it must be again watched with attention, and traced to its next place of depositing its eggs, to determine whether wheat or rye be its natural food in spring, or whether its attack on these plants be only in particular seasons when its own natural food may have failed; for Mr. Markwick takes notice, that it was only the early sown wheat that was affected.

From the foregoing observations of Mr. Markwick, that the

diseased plants, instead of being lost, produced a number of lateral shoots, and the crop in the field of wheat in which the fly had made some havock turned out exceeding well, it follows that Mr. Bjerkander's advice of picking up and burning the stems that are infested, would be highly prejudicial; but perhaps pinching the central leaves, just above the crown of the root, where the insect is usually found, might effectually destroy it, and leave the plant in a state to throw out its lateral shoots. If, however, a method could be discovered to destroy the parent animal, it would certainly be the most efficacious.

Nov. 1, 1791

THOMAS MARSHAM.

XI. *Description of Paspalum stoloniferum.* By Mr. Louis Bosc,
F. M. L. S.

Read Dec. 6, 1791.

P. Spiculis spicatis, rachi undulata, floribus alternis secundis,
caule geniculato; basi prostrato stolonifero.

H. in Perua.

Graminée vivace, à chaume solide.

Racine fibreuse, blanchâtre.

Tige rameuse, articulée, flexueuse, glabre, cylindrique, procom-
bante à la base, haute de deux pieds, fournissant des racines par
ses neuds. Rameaux alternes.

Feuilles vaginées, lanceolées, glabres, légèrement striées, un peu
ondulées en leurs bords, souvent longues de trois pouces et larges
de 8 lignes.

La gaine un peu plus courte que l'entreneud où elle se trouve,
stipulée et rougeâtre à son sommet. Chaque gaine renferme presque
toujours outre la tige qui lui appartient le bourgeon d'une nouvelle
tige, qui se développe à son tour. Stipule très-court, cilié, blan-
châtre.

Epi terminal, simple, de la longueur de 5 à 6 pouces.

Pedoncule commun rachidiforme, alterne, membraneux, undulé,
cilié en ses bords, long de 7 à 8 lignes et large d'une ligne, portant
sur sa face inférieure jusqu'à 18 fleurs alternes et distiques.

M 2

Pedon-

Pedoncule propre applati, à peine long d'une ligne.

Calice de deux valves égales, rougeatre. Les valves ovales, oblongues, ciliées à la pointe, fortement ondulées sur les côtés, principalement à la base. La supérieure convexe, l'inférieure concave.

Corolle de deux bales égales, ovales, membraneuses, incolores, un peu moins longues que le calice. La supérieure convexe, l'inférieure concave.

Etamines au nombre de trois, filaments attachés à la base du germe et deux fois plus longs que la corolle; antheres alongées, dydimes, rubescentes.

Pistil. Germe oval, très-petit, très-glabre. Deux styles de la longueur de la corolle. Stigmates à peu près de la même longueur, blancs et extrêmement hérifés. Ils sortent et se recourbent des deux côtés de la fleur au moment de la fécondation.

Semence unique, recouverte par la corolle et de même grandeur et couleur qu'elle. Elle est tronquée de braies au sommet du côté convexe et un peu fulcée du côté applati. La substance est cornée, demi-transparente.

Ce graminé ne s'écarte des caractères du genre de *Paspalum* de Linnéus que parce qu'il a la corolle plus courte que le calice, et les filaments plus longs que la fleur. Il est originaire du Pérou, d'où il est passé en Espagne. MM. Boutelou frères, qui en ont reçu la semence de leur père jardinier du Roi à Aranjúes, l'ont cultivé avec succès à Paris. Les semences qu'ils ont recoltées étoient en partie avortées; mais cette plante étant vivace, et ses neuds poussant facilement des racines lorsqu'ils sont couchés sur la terre, nous avons espérance de la conserver de drageons. Elle paroît propre par la hauteur et la multiplicité de ses tiges, par la largeur de ses feuilles, et par la succulence de toutes ses parties à servir de fourrage.





Paspalum stoloniferum.

EXPLICATION de la PLANCHE, Tab. 16.

- A. Le *Paspalum stoloniferum* de grandeur naturelle.
- B. Un epillet de grandeur naturelle vu en devant.
- C. Le même grossi.
- D. Le même vu par derrière.
- E. Un pedoncule commun grossi.
- F. Une fleur epanouie attachée au pedoncule commun.
- G. Le calice vu en dessus.
- H. Le même vu en dessous.
- I. La corolle.
- K. Le pistil et les étamines.
- L. La semence vue en dessus.
- M. La même vue en dessous.

XII. *Observations on the Structure and Oeconomy of some curious Species of Aranea. By Mr. Dorthes, F. M. L. S.*

Read Jan. 3, 1792.

COMME l'Araignée aviculaire (*Aranea avicularia* L.), qu'on nous porte d'Amérique sous le nom d'*Araignée crabe*, est la plus grosse espèce que nous connoissons de ce genre d'insectes, & que chez elle les parties sont très développées; j'ai profité de cette circonstance pour examiner plus facilement les caractères génériques des araignées fondés sur les parties de la bouche suivant le système entomologique de Mr. FABRICIUS, ce qui m'a donné lieu d'examiner aussi les parties génitales du mâle, qui, d'après plusieurs observateurs, sont placées sur les antennules.

Ma première surprise a été de ne trouver dans aucun individu les machoires, *maxillæ**, qu'on observe pourtant dans la plupart des autres espèces. J'ai vu à leur place un article qui dans d'autres espèces sert de base aux antennules & aux machoires en même tems, & qui ne diffère dans celle-ci des premiers articles des pattes, qu'en ce que la partie antérieure a un angle moins arrondi & moins velu.

J'ai voulu voir si d'autres araignées me présenteroient le même caractère; je l'ai retrouvé dans l'*araignée maçon*, que je décrirai ci-

* Nous prenons ici ce mot dans le sens que lui donne Mr. FABRICIUS, qui distingue les machoires d'avec les mandibules.

dessous,

deffous, & dans quelques autres espèces qui par leur configuration externe se rapprochent de l'*araignée aviculaire*. Afin qu'on puisse comparer la différence qui existe à cet égard entre l'*araignée aviculaire* & les autres espèces, je joins ici des figures des parties de la bouche de l'*araignée aviculaire* & de l'*araignée domestique* (tab. 17. figure I. & III.)

Je conclus de cette première observation, que la présence des mâchoires ne peut point être comprise dans les caractères génériques des araignées, & qu'à cet égard la méthode de Mr. FABRICIUS peut être rectifiée, quoique d'ailleurs elle soit la plus sûre que nous connoissions jusqu'à présent pour nous conduire à la connoissance des familles naturelles.

J'ai vu ensuite presque à l'extrémité des crochets des mandibules (fig. I. lettre b.) une ouverture essentielle qui a échappé aux observations de la plupart des entomologistes modernes. On peut voir ce qu'ont dit à ce sujet dans l'*Encyclopédie méthodique*, MM. MAUDUIT & OLIVIER, qui avouent que malgré toutes leurs recherches, ils n'ont pu trouver aucune ouverture sur ces parties (voyez l'*Encyclop. méthodique. Insectes* au mot *Araignée*, pag. 186, & dans les disc. prélim.). SWAMMERDAM lui-même, qui a porté tant de scrupules dans l'anatomie des insectes, dit aussi qu'il n'a pu voir aucune issue sur les mandibules des araignées (voyez *Biblia naturæ*, p. 49). Mr. GEOFFROY les a cependant apperçues: il n'en a parlé, à la vérité, qu'en passant, mais assez pour nous faire comprendre qu'il les connoissoit bien; voici tout ce qu'il en dit. "Ces mêmes pointes lui servent aussi de bouche; quoique leur extrémité soit fort aigue, elle est cependant percée vers le bout, & le dedans des tenailles est creux, en sorte que l'araignée succe par là les humeurs de la mouche ou de tel autre insecte qu'elle a faisi."—(*Hist. abrég. des Insectes*, t. 2. p. 632.) C'est sans doute à cause de leur analogie avec celles d'autres insectes qui ne se nourrissent qu'en sucçant avec des instrumens de cette forme, que Mr. GEOFFROY pense de cette manière; mais il n'est point assuré que

que cela se fasse ainsi ; j'ai vu plusieurs fois des araignées avaler peu à peu des insectes dont ils rejettent quelques fois les débris en pelotte après les avoir conservés pendant quelques momens dans l'intérieur de la bouche. D'un autre côté, j'ai souvent irrité avec la lame d'un couteau de grosses araignées telle que la Tarantule (*Aranea Tarantula* L.) que nous avons ici très-commune dans les champs arides ; en pinçant le tranchant de la lame, elles laissent échapper très-promptement, par l'extrémité des mandibules, des gouttelettes d'une humeur limpide sans couleur que je me suis assuré être leur venin, comme je le rapporterai ailleurs. Il y a donc apparence que ces ouvertures ne sont destinées qu'à laisser échapper le venin de l'araignée. Elles sont allongées, & se trouvent chacune à la partie antérieure de l'extrémité du crochet au point désigné dans la figure I. par la lettre b.

Après avoir reconnu l'emplacement de ces ouvertures dans l'*araignée aviculaire*, il ne m'a point été difficile de les retrouver dans les autres espèces de ma collection, & il n'en est aucune chez qui je n'ai pu la voir par le secours d'une forte loupe.

Quant aux antennules de l'*araignée aviculaire*, voici ce qu'elles m'ont présenté de singulier.

Elles sont composées dans les mâles d'un article de plus que dans les femelles. C'est dans cet article que sont contenues, à ce qu'on croit, les parties génitales, dont on n'a point déterminé jusqu'à présent la configuration. Il est presque rond & placé à l'extrémité de l'antennule ; il a en dessous une rainure au milieu de laquelle se trouve logé un crochet considérable qui jouit d'un mouvement de charnière. Lorsque l'articulation est fermée, le dos du crochet se loge dans une autre rainure située en dessous du second article. La figure II. e. donnera une idée de cette singulière structure.

Cet article manquant dans les femelles, l'antennule se termine chez elles comme les pattes. Voyez fig. I. c. c.

Du reste on ne peut appercevoir sur les crochets ni sur le dernier article de ces antennules aucune ouverture par laquelle puisse s'échapper la semence ; il faut cependant qu'il y en ait une, s'il est vrai, comme on l'a observé, que les antennules des araignées mâles contiennent les parties génitales.

Ce dernier article manquant aux femelles des araignées en général, chez elles l'antennule se termine comme les pattes, ce qui fournit un moyen de les distinguer d'avec les mâles. J'ai observé un moyen aussi sûr pour distinguer les sexes chez l'araignée aviculaire : c'est que la femelle n'a point au cinquième article de la première paire de pattes les deux crochets immobiles qu'on voit chez le mâle, comme l'indique la figure II. lettre f. †.

J'ai comparé les antennules de l'araignée aviculaire mâle, avec celles de plusieurs autres espèces, j'ai trouvé une grande variété de formes entr'elles dans la partie qu'on a dit contenir les parties sexuelles. Ces formes pourroient fournir des caractères dans les espèces difficiles à distinguer. Je me contenterai dans ce moment de donner la description & la figure de l'antennule de l'araignée domestique mâle, dont la conformation est des plus bizarres.

Le dernier article est un ovoïde dont la partie la plus étroite est très-allongée, & forme l'extrémité. La partie la plus large est creusée en cuillier. Au milieu de la cavité est fixé un appendice dont la base est globuleuse ; il se termine par divers prolongemens, dont on peut prendre une idée par les figures III. IV. V. & leurs explications qui y sont jointes.

Je terminerai ce mémoire par la description de l'araignée maçonne (figure VI.) dont les mœurs singulières ont été décrites par Mr. l'Abbé SAUVAGES dans l'Histoire de l'Académie des Sciences de Paris, mais qui n'a point donné une description suffisante de l'animal, ce qui est cause que LINNE & FABRICIUS n'en ont point parlé.

Elle ressemble en petit à l'araignée aviculaire : ses yeux, placés sur une verrue au nombre de huit, ont la même disposition (voyez figure VII.) : elle a comme elle une cavité transversale au milieu du corcelet, qui cependant est un peu plus allongé. Elle manque comme elle de mâchoires ; sa couleur est gris-brun ; le dessus du ventre est parsemé de points irréguliers noirs, disposés en six à sept rangs de chevrons, dont la pointe qui occupe le milieu du dos de l'abdomen se dirige vers le corcelet. Elle peut être décrite de la manière suivante dans le stile Linnéen.

ARANEAE SAUVAGESII, griseo-brunnea, thorace convexo centro transverse excavato, abdomine ovato atomis atris adperso.

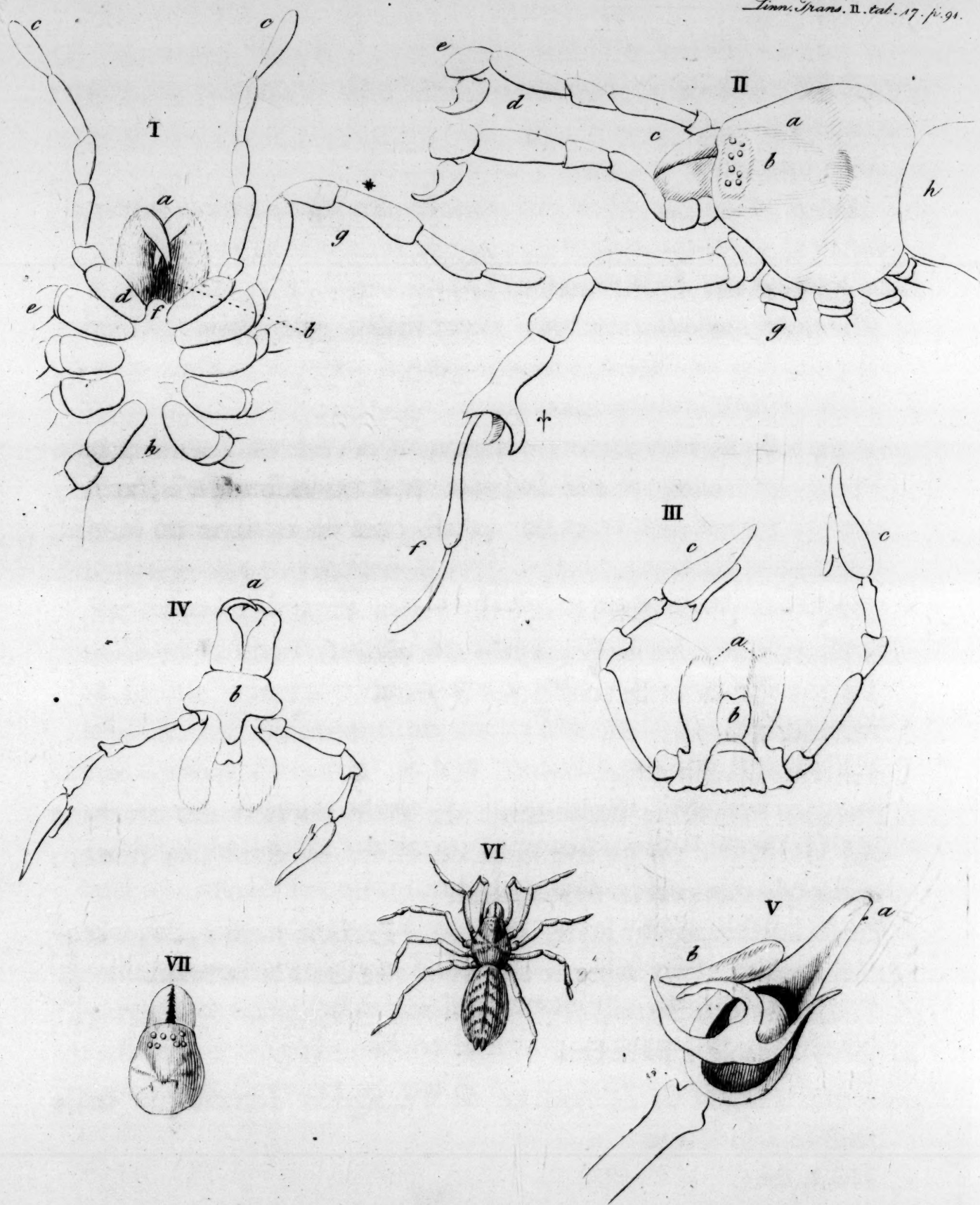
Aux faits nombreux rapportés par Mr. l'Abbé SAUVAGES sur les mœurs étonnantes de cet insecte, j'en ajouterai quelques-uns qui ne sont pas moins intéressans.

J'ai trouvé plusieurs fois dans la même habitation le mâle & la femelle avec une trentaine de petits. On voit par là, qu'elle est plus sociale que la plupart des autres espèces, qui se dévorent entr'elles. Si cependant on met dans un même vase plusieurs de ces araignées, & qu'on ne leur fournisse aucune nourriture, elles s'entretuent, & se dévorent.

Le fond de leur habitation contient des débris de diverses espèces d'insectes, même de coléoptères assez gros.

Ce n'est que de nuit que ces araignées courent après leur proie, & qu'elles travaillent à leur habitation. Si on fixe avec une épingle l'opercule de terre qui ferme leur demeure, on voit le lendemain, qu'elles ont fabriqué pendant la nuit une nouvelle porte à côté. De même si on enlève cet opercule, on en trouve un autre le lendemain à la même ouverture.





EXPLICATION des FIGURES. TAB. 17.

Figure I. Parties de la bouche de l'araignée aviculaire de grandeur naturelle.

- a. Mandibules.
- b. Extrémité de la pince des mandibules où se trouve une ouverture.
- c. c. Antennules de la femelle.
- d. Première articulation des mandibules, qui, dans plusieurs espèces, sert de base aux mâchoires qui manquent dans celle-ci.
- e. Premier article des pattes.
- f. Lèvre inférieure.
- g. Patte antérieure privée de crochets dans la femelle à l'article noté *, tandis que le mâle en est pourvu comme on le voit à la figure II. f. †.
- h. Naissance du ventre.

Figure II. a. Corcelet de l'araignée aviculaire.

- b. Verrue sur laquelle sont posés 8 yeux.
- c. Mandibules.
- d. Antennules du mâle.
- e. Dernier article de l'antennule du mâle portant des crochets qui jouissent d'un mouvement de charnière dans une rainure pratiquée dans cette articulation.
- f. Patte antérieure du mâle, portant à l'article noté †, deux crochets immobiles qui ne se trouvent pas dans la femelle.
- g. Naissance des pattes.
- h. Naissance de l'abdomen.

Figure III. Parties de la bouche de l'araignée domestique mâle grossies à la loupe.

- a. Mâchoires.
- b. Levre inférieure.
- c. c. Antennules.

Figure IV. Les mêmes parties rabaisées pour laisser voir l'intérieur de la bouche & les mandibules.

a. Mandibules.

b. Corps charnu mameloné, placé dans l'intérieur de la bouche.

Figure V. Extrémité de l'antennule vue encore plus grosse pour distinguer les appendices qui y sont contenus.

a. Dernière articulation de l'antennule creusée en cuillier.

b. Appendice supporté par un globule fixé dans la cavité.

Figure VI. Araignée maçonne.

Figure VII. Corcelet de l'araignée maçonne dessiné plus grand que nature pour mieux voir la disposition des yeux.

XIII. *Account of the Germination and Raising of Ferns from the Seed.*
By Mr. John Lindsay, Surgeon in Jamaica. Communicated by Sir
Joseph Banks, Bart. P. R. S. and H. M. L. S.

Read Jan. 3, 1792.

IT was not generally known many years ago that ferns bore any seed, hence the notion of its power of rendering whomsoever possessed it invisible*; and it does not appear that the writers on Natural History are yet very well acquainted with the real seeds of ferns, or from what particular part the young plants are produced. In the *Encyclopedia Britannica*, 3d edition, where good information might be expected, we have this account of the fructification of ferns: "The flowers, whatever be their nature, are, in the greater number of genera, fastened, and as it were glued to the back of the leaves; in others, they are supported upon a stem which rises above the leaves, but in some are supported on a flower-stalk as already mentioned: the stamina are placed apart from the seed-bud in a genus termed by Mr. Adanson *Palma filix*: in the other ferns, where we have been able to discover the stamina, they are found within the same cover with the seed-bud†." While studying medicine at Edinburgh, I had good opportunities of getting acquainted with the fructification of ferns, under the direction of my worthy

* "We steal as in a castle, cock sure; we have the receipt of fern-seed, we walk invisible." SHAKESPEARE.

† Vide Filix in the article Botany.

friend and patron Dr. Hope, late professor of botany there. But I did not then learn that any of those parts which I had seen were the real seeds, or capable of producing new ferns. I understood that this point was still uncertain.

When I came to Jamaica, I observed great numbers of small young ferns rising after the rains in marle and gravel pits, and on the shaded banks of rivers which had been broken down by the floods; and indeed in every place where the earth had been dug into, and left shaded and untouched for a few months, numbers of young ferns of different kinds generally began to appear. This I considered as a fair opportunity of ascertaining from what part the young fern arose. I had some spare time, which with propriety I could dedicate to that purpose, being assistant to my good friend Dr. Clarke, botanist for the island, and I had the opportunity of a good microscope. The minuteness of the seeds rendered every attempt to discover them, by searching at the roots of even the smallest visible plants, entirely fruitless. I then thought of sowing the powder or dust, which falls from the fern leaves when drying, in a flower-pot, of keeping them in my room, and of observing their progress. To enable me to do this with ease and certainty, I mixed some of the powder with some of the mould it was to be sown in, and by the help of the microscope was soon able to distinguish readily the different parts of the powder, or fructification, from the particles of the mould in which it was sown. Having collected the dust of some of those ferns which, from the number of their young ones rising every where, promised to grow readily, and sown it in a pot filled with the same kind of mould in which the young ones grew, I placed the pot in a window of my room, watered it daily, and every day or two examined a small portion of the mould by the microscope. I could always readily distinguish the dust or seeds from the mould, but observed no alteration till
about

about the 12th day after sowing, when many of the small seeds, represented at 6 in the annexed plate, had put on a greenish colour, and some were pushing out their little germ, like a small protuberance, the rudiment of the new fern, as at 8. This little protuberance gradually enlarged, and successively put on the appearances at 9, 10, and 11. They had acquired small roots, and the remains of the little seeds were still discernible where the roots of the infant plant commenced. Although the young ferns were now very conspicuous by the microscope, the naked eye could see nothing but a green appearance on the surface of the mould, as if it were covered with some very small moss: this was the numberless young plants from the quantity of the seed sown. In some weeks this moss began to appear to the naked eye like small scales, as at 13, which gradually enlarged, as at 14: they were generally of a roundish figure, somewhat bilobate, but sometimes more irregular; they were of a membranous substance, like some of the small *lichens* or liverworts, for which they might readily be mistaken, and of a dark green colour. At last there arises from this membrane a small leaf, different from it in colour and appearance, as at 15, and shortly after another still more different, as at 16. Now each succeeding leaf grows larger than the last, till they attain the full size, and are complete in all the parts and discriminating characters of their respective species. Some of the above observations appearing to me new, I communicated them to Dr. Hope. He judiciously offered a few queries, founded on the deceptions to which observations made by high magnifiers are often liable: these I endeavoured to answer; he was satisfied, and promised to lay the observations before the Royal Society of Edinburgh.—But that city soon after lost an amiable member of society, and I a friend, whose memory will be dear to me while I live. Engaging in the practice of medicine soon after, I thought no more of the subject, till I had the honour of a
very

very polite letter from Sir Joseph Banks, Bart. P. R. S. dated March 29, 1789, where, after mentioning some other plants, he observed that ferns would be particularly acceptable. In answer I observed, that the risk of carrying many of the ferns alive such a distance was great, and proposed to send some of their seeds, which, being properly sown, I had reason to believe would grow. He very soon informed me that, if I could furnish the means of making the ferns of this island grow in England from the seeds, I should have the credit of making a very valuable discovery, and requested I would send him some seeds, with my notes on this subject, by the first opportunity. Being now more convinced that the seeds, and progress of the germination of ferns, were still but little known, I collected the seeds of 16 or 18 different sorts, and sowed them in a flower-pot in my room, of about 10 inches diameter, each in a separate space, and marked. I kept the pot in my room, and watered them duly. They all appeared between the 10th and 20th day, in the form of a small green moss on the surface, and at length were putting on the membranaceous form, when they were all destroyed by being exposed to the sun in a dry hot day. I repeated the sowing of the seeds in the flower-pot; and also sowed others in the mouth of a marble pit, shaded from the sun's rays, where no ferns of the same kind had grown before. They are all now growing; and those in the flower-pot have made some progress in the membranous form; and in the marble pit they are beginning to put out the leaves peculiar to their species.—Having now pointed out the seeds, or that part of the fructification, from which the young plants of this beautiful and curious tribe of vegetables, the ferns, arise, and shown the beginning of their germination and progress of their growth; it remains to say a few words concerning the gathering and sowing of their seeds.

The seeds of ferns may be procured with readiness and ease by
taking

taking those frondes or leaves on which the fructification is copious, fair and conspicuous; which are of full growth, have a healthy appearance, and are more exposed to the free air than confined in shade. These leaves, laid on clean paper in a dry place, soon shed their seed in the form of dust or fine powder, of colour varying from black or brown to yellow: the grosser part of this powder is the empty capsules, and that very fine part which adheres closely to the paper is the seed. The seeds thus procured may be sown immediately, or kept in paper in a dry place. How long they will retain the principle of vegetation I cannot say. I have kept some above three months, which grew well enough when sown; but they seemed to be rather longer in vegetating than those freshly gathered. There are doubtless many species of ferns, which, like other vegetables, require a soil and situation peculiar to themselves, yet we often find the same species growing in different soils: hence the propriety of attending to the soil and situation of each species is pointed out, and at the same time there is room left for trying a general medium.—I took equal parts of brick mould and good pit marle, at some depth below the surface, to avoid the seeds of other plants, mixed them well together, and with this filled the flower-pot, moistened it properly, and made the surface very smooth: I then divided it into small spaces, according to the number of the different kinds intended to be sown in it; and lastly strewed the seeds lightly on the surface, which may be moistened with a little water just before they are sown: they require no covering. They should now be placed in a heat corresponding to that of their native climate, in a place rather moist than too dry, freely open to the light and fresh air, but so shaded that the direct rays of the sun shall not reach them. All ferns seem to grow best in moist and shaded places; and although many of them will bear the sun's rays very well when grown up, few of them, I believe, will do so

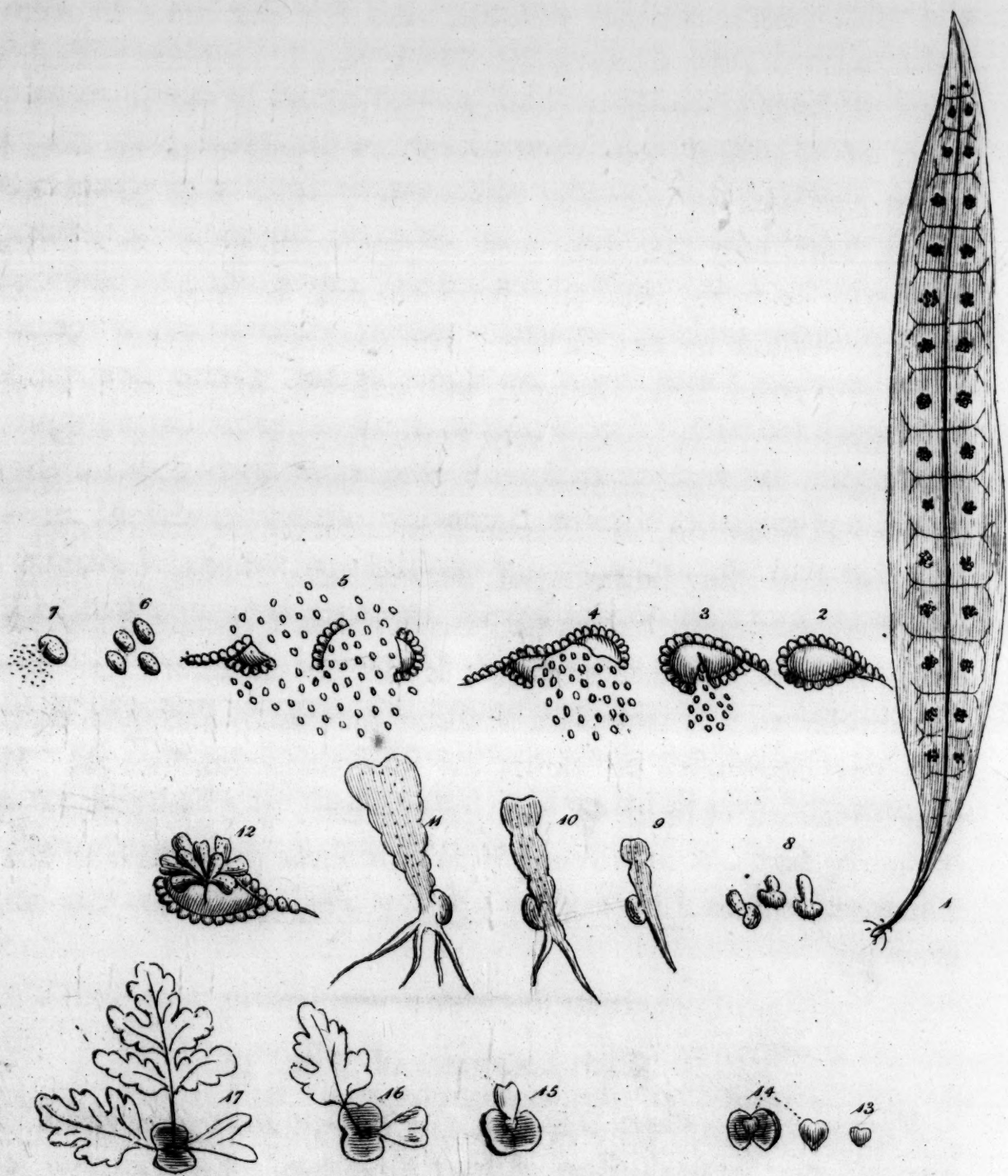
when very young. They should be daily moistened with water in the most gentle manner possible, and the pot may be kept in a basin with a little water in it. Great care is requisite to keep them from all sorts of vermin: covering the mouth of the pot with a network of fine brass wire answered this purpose with me.—In about 10 or 15 days, or perhaps later, the surface will begin to look green, as if some fine moss were beginning to grow on it: this will gradually increase, and the progress will be nearly as I have described.—What relates to the transplanting of them, after they have acquired a little strength, will easily be judged of by every one accustomed to the raising and transplanting of other plants; and the rearing of them afterwards will be best understood by attending to the soil, situation, and climate from which they have come. What space of time may be required between the sowing of their seeds and their acquiring the leaves proper to each species, I cannot readily point out; in different sorts it may be different: the shortest I have observed has been almost three months, sometimes more; but this may be varied no doubt by various circumstances. Having thus given an account of the germination and progressive growth of young ferns, it only remains to give some description of the fructification, which I shall do in a few words, assisted by the annexed drawing.

EXPLANATION of TAB. 18.

Figure 1. represents a leaf of the *Polypodium lycopodioides*, and the dots the little clusters of fructifications. Each cluster is generally* covered with a thin membrane or scale, commonly called the

* Many, if not most species of the genus *Acrostichum*, and this, with several other species of *Polypodium*, want this membrane or calyx. This difference therefore, *Flores caliculati, et non caliculati, vel nudi*, might be useful in distinguishing the numerous species of this extensive genus.

calyx.





calyx, and consists of a number of small globules or capsules: each capsule is girt with an elastic and apparently articulated ring, which when dry, breaks suddenly, rends the capsule, and scatters the seeds in the form of a fine dust*.—2. One of the capsules and its elastic ring magnified.—3, 4, and 5. Different views of the capsule bursting and discharging the seeds.—6. The seeds highly magnified appearing full of dots, as if they contained another series of bodies within them: this has been alleged as a proof of their not being the real seeds.—7. The seed burst by being bruised when moist, its contents giving the appearance of small grains mixed in a transparent mucilage.—8, 9, 10, and 11. Different degrees of progress in the germination, to be seen only by being highly magnified.—12. A whole capsule prevented from bursting by moisture, with the seeds vegetating, and making their way through it.—13. The first appearance of the young fern in the form of a small thin scale; these may be seen by the naked eye.—14. The scales gradually becoming larger, and appearing like small *lichens* or liverworts.—15. The first appearance of the first true leaf of the fern.—16, 17. Ferns with the second and third leaves beginning to take the form of their proper species.

HAVING now given some useful additions to the history of this beautiful tribe of plants, the Ferns, I shall conclude with expressing my hopes that some additional light will soon be thrown on the fructification and germination of those curious vegetables the *Musci* or Mosses, and others of the class *Cryptogamia*, by men of abilities, and shall give an instance in proof that the hope is

* With the anthera, or what is analogous to it, I am yet unacquainted; it has been supposed to be the elastic ring, but I do not know if with good reason.

not ill founded.—I have very lately sown that fine farina or dust contained in the anthera of a species of the genus *Bryum*, viz. *Bryum cespitium*, or one very like it, and also the farina of the *Lycopodium cernuum*. There is a vegetable growth taking place where they were sown, which I hope will prove their young plants.—If this should be the case, that which has generally been called the anthera, must be considered as the true capsule or seed-vessel, and the antheræ must be sought for anew.

XIV. *Additional Observations relating to Festuca spadicea and Anthoxanthum paniculatum.* By James Edward Smith, M. D. F. R. S. and P. L. S.

Read Feb. 7, 1792.

IN a paper which the Linnean Society have honoured with a place in the 1st volume of their Transactions, page 111, I have endeavoured to elucidate the botanical history of the *Festuca spadicea* and *Anthoxanthum paniculatum* of Linnæus, concluding these grasses, from all the means of information then within my reach, to be one and the same plant. That no possibility of doubt might remain, nor the synonyms of this obscure species want any certainty that could be procured, I last summer requested Professor Thunberg to compare one of my specimens with that in Burser's Herbarium at Upsal, which is the only positive authority for ascertaining what Linnæus meant by his *Anthoxanthum paniculatum*. In a letter dated Dec. 28, 1791, the Professor assures me there is no doubt of their perfect identity.

Knowing myself to be the sole author of this elucidation, the progress of which is detailed in the paper above mentioned, it is not without some surprise that I read in Professor Vahl's 2d fasciculus of his *Symbolæ Botanicæ*, page 22, the material parts of my discovery given as his own in the following words.

Festuca spadicea—Linn. S. V. pag. 118. Gouan illustr. p. 4.

Anthoxanthum paniculatum—Linn. S. V. p. 73. fide Herbarii

LINNÆI.

Poa Gerardi. Allion. Fl. Ped. No. 2201.

Variat calycibus 3-five 5-floris.

Now

Now the manner in which this is expressed implies that the author had, from the Linnæan Herbarium, learned *Festuca spadicea* and *Anthoxanthum paniculatum* to be the same plant; whereas it is sufficiently manifest, from my former paper, he could never have discovered from that source what either of those plants was; there being nothing in the Herbarium to represent the latter, and of the former only an imperfect anonymous specimen, placed at the end of the genus of *Festuca*, which could never have been ascertained but by the peculiar train of circumstances which led me to the knowledge of it, and which was certainly never known to be *Festuca spadicea* till it was announced as such before this Society, Oct. 5, 1790, that is, about five years after Professor Vahl saw the Herbarium; still less had any botanist in Europe till then supposed the same *Festuca* to be *Poa Gerardi* of Allioni.

XV. *Plantæ Eboracenses; or, A Catalogue of the more rare Plants which grow wild in the Neighbourhood of Castle Howard, in the North Riding of Yorkshire, disposed according to the Linnean System. By Mr. Robert Teesdale, F. L. S.*

Read Feb. 7, 1792.

DURING the time I resided at Castle Howard, in the county of York, some of my leisure hours were employed in herborizing: my business not admitting of long excursions, it enabled me to take the more pains in the collecting of the plants of my own neighbourhood.

The woods about Castle Howard are extensive, and the bogs near Terrington produce many valuable acquisitions to the curious investigator.

The downs called the Wolds are likewise productive of some good plants.

I seldom extended my rides, or walks, upon those botanical excursions, more than ten or fifteen miles from home; and upon summing up the plants that I had observed, and collected, they amounted to nine hundred and sixty. This I presume, will be thought a great number to be found, in so small a space of country, by one collector; as the learned Dr. Martyn tells us, in his *Plantæ Cantabrigienses*, that with the indefatigable labours of Mr. Ray,
8 Mr.

Mr. Lyons, himself, and doubtless many other residents of the University, they have made their catalogue amount to eight hundred and twenty-nine only.

In the following list, most of the plants which are common in every part of our island are omitted, excepting in the Cryptogamia class.

Notwithstanding I have found such a number, I have no doubt but, upon a more nice investigation into the minutiae, with such accuracy and knowledge as my friend Mr. Dickson possesses, many more plants may be discovered.

To the more rare ones I have added their *habitats*, by which means the travelling botanist may the more readily find the plant he may wish to add to his Herbarium.

Monandria Monogynia.

Hippuris vulgaris - - in rivers and rivulets, not very common.

Diandria Monogynia.

Veronica montana - - in woods at Castle Howard.

Pinguicula vulgaris - - upon moist heaths.

Utricularia vulgaris - } in a peat moss called Terrington Car.
 minor - }

Circaea alpina - - in the woods near Kirkham.

Triandria Monogynia.

Schoenus compressus - upon Welburn Moor—but rare.

Mariscus - in Terrington Car—but rare.

albus - - } in the above Car.
 nigricans - }

Scirpus

- Scirpus cæspitosus* - - }
acicularis - - } upon Stockton Common, Terrington Car,
setaceus - - } and many other watery heaths.
fluitans - - }
sylvaticus - - near the Abbey at Kirkham, and in
 Pretty-wood at C. Howard.

Eriophorum vaginatum upon a heath N. West of Terrington.

Digynia.

- Milium effusum* - - in woods at Castle Howard, but rare.
Agrostis Spica-venti - in Bulmer corn fields, but is scarce.
Aira montana - - in stony woods and heaths about Castle
 Howard.
Poa compressa - - upon old walls at Castle Howard, but
 not common.
Festuca ovina - - upon dry heaths.
vivipara - - upon Hambleton hills, but rare.
Bromus arvensis - - in Bulmer and Malton corn fields.
pinnatus - - near Nunnington, and other places.
Arundo Calamagrostis - } in woods at Castle Howard, the latter
epigejos - } very rare.
Lolium temulentum - amongst corn, but is not common.
Hordeum sylvaticum - in the woods at Castle Howard.

Tetrandria Monogynia.

- Asperula cynanchica* - upon Langton Wold near Malton.
Galium montanum - upon dry heaths.
uliginosum - in Terrington Car.
spurium - - in Malton corn fields.
boreale - - near Helmsley, but very rare.
Cornus herbacea - - in a place called Hole of Huckham,
 near Pickering, abundantly; first
 found there by my father.
Alchemilla minor - - in woods at Castle Howard.

Tetragynia.

Potamogeton compressum in a rivulet at Hovingham.

pufillum
gramineum } in the fish ponds at Castle Howard.

Pentandria Monogynia.

Lithospermum officinale in stony woods at Castle Howard.

Cynoglossum officinale near Mowthorpe Dale.

Symphytum officinale upon the banks of the river Derwent.

Primula farinosa - - upon heaths near Helmsley.

Menyanthes nymphoides in the lake of Castle Howard abundantly, where I planted it—I believe it is not a native of that neighbourhood.

Atropa Belladonna - in stony places at Castle Howard, and in the neighbourhood.

Samolus valerandi - - upon Stockton moor, by the side of the turnpike road.

Campanula latifolia - in Slingsby lanes.

Trachelium in Heflerton woods.

hybrida - in Malton and Bulmer corn fields.

Digynia.

Gentiana Pneumonanthe in Terrington car, and Stockton common.

campestris - upon Terrington common, rare.

amarella - upon the wolds and dry heaths.

Cuscuta europæa - - this is not common in the north, though so abundant in the south of England.

Bupleurum rotundifolium in the corn fields near Malton and Slingsby.

Tordylium nodosum - }
Caucalis leptophylla - } in Malton fields.

Heracleum angustifolium in Castle Howard woods, but rare.

Sison inundatum. - - in watery places, not uncommon.

Pen-

Pentagynia.

- Linum perenne* - - in Bulmer field, at the end of the avenue
which leads to Castle Howard.
Radiola - - Terrington common.
Drosera rotundifolia - in Terrington car.
longifolia - } with the above, but the last species is
anglica Hudf. } rare.

Polygynia.

- Myofurus minimus* - in fields south-east of Welburn.

Hexandria Monogynia.

- Allium arenarium* - - in a meadow called Santines at Castle
Howard, very scarce, and I never found
it in any other place.
oleraceum - in plowed fields near Hovingham moor.
Ornithogalum luteum near Stitnam, but rare.

Trigynia.

- Triglochin palustre* - in Terrington car.

Heptandria Monogynia.

- Trientalis europæa* - - upon the moors near Helmsley.

Octandria Monogynia.

- Epilobium angustifolium* in Bilfdale, above Helmsley.
Vaccinium Oxycoccus in Terrington car.
Daphne Laureola - - in woods—common.

Trigynia.

- Polygonum Bistorta* - in moist meadows.

Tetragynia.

- Adoxa Moscatellina* - in shady places near Kirkham.
Paris quadrifolia - in most of the shady woods.

Enneandria Hexagynia.

Butomus umbellatus - in the river Derwent, at Howsham.

Decandria Monogynia.

Pyrola rotundifolia - in woods at Helmsley.

Digynia.

Chrysosplenium oppositifolium - in Mowthorpe dale, and in moist shady lanes and woods.

alternifolium near Hornby, but is very rare.

Scleranthus annuus - in Bulmer field, but rare.

Dianthus deltoides - about Scampston.

Trigynia.

Stellaria nemorum - by rivulets, and shady moist woods.

Arenaria tenuifolia - upon Barton heights, near C. Howard.

Pentagynia.

Spergula nodosa - upon moist heaths.

Icosandria Polygynia.

Rubus idæus - in the woods at Castle Howard.

saxatilis - in stony woods, but rare.

Potentilla argentea - } in rocky woods, at Castle Howard and
verna - } Hovingham.

Geum rivale - in moist woods, common.

Comarum palustre - in Terrington car.

Polyandria Monogynia.

Actæa spicata - at Hildersley, and in Hovingham lanes.

Papaver hybridum
Argemone
dubium } in Malton corn fields.

Nymphæa alba - near Sheriff Hutton, and in the river Foss.

Hexagynia.

- Stratiotes aloides* - - I planted this in the lake at Castle Howard, where it has increased so much that one can hardly get a drag net through it.

Polygynia.

- Ranunculus Lingua* - in Terrington car.
parviflorus in Malton fields.
Trollius europæus. - in Hovingham woods, near Holley-hill.
Helleborus viridis - in the hedges near Stonegrave, but is scarce.

Didynamia Gymnospermia.

- Mentha piperita* - by the side of a rivulet at Lutton upon the wolds.
Galeopsis tetrahit - amongst the corn, frequent.
Scutellaria minor - in Terrington car.

Angiospermia.

- Orobanche major* - in Malton field.
Lathræa squamaria - in the woods near Kirkham, at the foot of some rocks.

Tetradynamia Siliculosa.

- Iberis nudicaulis* - - in Bulmer fields.

Siliquosa.

- Turritis glabra* - - in the lanes near Thirsk.
Cardamine amara - - by the river Derwent at Kirkham, and in many other places.

Monadelphica Decandria.

- Geranium fanguineum* in Malton fields.

Polyandria.

Polyandria.

- Malva Alcea - - } in Malton and Bulmer corn fields, by the
moschata - - } hedges.

Diadelphia Decandria.

- Lathyrus Aphaca - in Malton fields.
Vicia fylvatica - - this beautiful vetch grows in Slingsby
wood, and Coneysthorpe banks, near
Castle Howard.
Ornithopus perpufillus in sandy corn fields.
Astragalus arenarius, *Huds.* upon the wolds near Birdfall, and by
the road from Malton to Settrington.

Polyadelphia Polyandria.

- Hypericum montanum in woods at Castle Howard.
elodes - in Terrington car.

Syngenesia Polygamia æqualis.

- Hieracium paludofum }
subaudum } in woods at Castle Howard.
umbellatum }
Bidens minima - - in Terrington car.

Polygamia superflua.

- Gnaphalium dioicum upon Bulmer and Wilburn moors.
fylvaticum in various places.
Inula Helenium - - in Mowthorpe dale.
Anthemis nobilis - upon Terrington common.

Monogamia.

- Viola palustris - - in Terrington car, and other bogs.
lutea - - upon the wolds, and I have sometimes
found it with large purple flowers.

Gynan-

Gynandria Diandria.

<i>Orchis bifolia</i>	-	-	}	in woods and meadows at C. Howard.
<i>mascula</i>	-	-		
<i>morio</i>	-	-		
<i>latifolia</i>	-	-		
<i>maculata</i>	-	-	}	in dry stony meadows, about Castle Howard.
<i>pyramidalis</i>	-	-		
<i>ustulata</i>	-	-		
<i>conopsea</i>	-	-		
<i>Satyrion viride</i>	-	-	}	in dry meadows and pastures; the latter is rare.
<i>fuscum</i>	-	-		
<i>albidum</i>	-	-		
				upon the mountains north of Helmsley; rare.
<i>Ophrys Nidus-avis</i>	-	-		in Coneythorpe banks, an extensive shady wood near Castle Howard.
<i>spiralis</i>	-	-		in dry pastures at Whitwell, but is scarce.
<i>ovata</i>	-	-		in woods.
<i>cordata</i>	-	-		I found this elegant little plant amongst the heath upon Hornby hills.
<i>muscifera</i>	-	-	}	near Hildenlay stone-quarry, but not frequent.
<i>apifera</i>	-	-		
<i>Serapias latifolia</i>	-	-	}	in Raywood: var. γ . in bogs at the bottom of Prettywood, at C. Howard.
var. β . γ .	-	-		
<i>longifolia</i>	-	-		
				in a wood called Cum Hag at C. Howard, rare.

Monoecia Monandria.

<i>Zannichellia palustris</i>	-	-		in fish ponds at Castle Howard.
<i>Chara tomentosa</i>	-	-		in the new river at Castle Howard.
<i>hispida</i>	-	-		in old marle pits, near Sheriff Hutton.
<i>flexilis</i>	-	-		in Terrington car.
<i>vulgaris</i>	-	-		in all ponds.

Dian-

Diandria.

Lemna minor	-	-	} in rivers and ponds, the two latter are not very common.
trifulca	-	-	
polyrrhia	-	-	

Triandria.

Carex dioica	-	-	} upon Stockton moor, and other heaths.
pulicaris	-	-	
brizoides	-	-	} in Terrington car, but very rare.
limosa	-	-	
paniculata	-	-	} upon various heaths, woods, &c. in the neighbourhood of Castle Howard.
disticha	-	-	
leporina	-	-	
vulpina	-	-	
muricata	-	-	
pilulifera	-	-	
flava	-	-	
cæspitosa	-	-	
distans	-	-	
faxatilis	-	-	
panicea	-	-	} in various places, not uncommon.
pallefcens	-	-	
fylvatica	-	-	
acuta	-	-	
hirta	-	-	
vesicaria	-	-	

Tetrandria.

Littorella lacustris	-	upon Stockton common, and Terrington car.
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Dioecia Triandria.

Empetrum nigrum	-	upon Earfley moor, and above Helmſley.
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Tetran-

Tetrandria.

Viscum album - it is very common in the West Riding of Yorkshire, but is hardly to be met with in the North and East Ridings.

Cryptogamia Filices.

Equisetum hyemale - in some dry woods at Castle Howard, and Kirkham, not common.

Ophioglossum vulgatum in some meadows at Castle Howard, but rare.

Osmunda lunaria - upon the Mausoleum-hill, and near the Pyramid at Castle Howard.

Acrostichum Thelypteris in Terrington car; I never met with it in any other place.

<i>Asplenium Scolopendrium</i>	}	common.
<i>Trichomanes</i>		
<i>Ruta muraria</i>		
<i>Adiantum nigrum</i>		

<i>Polypodium vulgare</i>	}	in woods, common.
<i>aculeatum</i>		
<i>Filix mas</i>		
<i>Filix foemina cristatum</i>		

<i>Phegopteris</i>	}	in the stone quarry at C. Howard, and in woods at Hornby and Helmsley.
<i>Dryopteris</i>		

Oreopteris, Dickf., fasc. in woods at Castle Howard and Hornby.

Though the late ingenious Mr. Lightfoot does not take notice of this elegant fern in his *Flora Scotica*, it was not unknown to him, as some letters passed betwixt him and me concerning it. At first he insisted on its being the *Acrostichum Thelypteris*; but I con-

vinced him of the contrary. And he afterwards thought it might possibly be the *Polypodium marginale* of Linnæus; but Mr. Dickson says, upon comparing it with that plant in the Linnæan Herbarium, it is found to be very different.

The leaves of this *Polypody* have a very agreeable scent, which I have not observed in any other of the English ferns. Perhaps the *Polypodium fragrans* of Hudson may be only a variety of this.

Pilularia globulifera - upon Stockton moor, Terrington car, and other watery heaths.

Musci.

Lycopodium clavatum upon Earlsley moor.

Selago -
Selaginoides inundatum } in Terrington car, and upon Welburn moor.

Sphagnum palustre - in all bogs.

alpinum - Terrington common. I never found it in fructification.

arboreum - upon trunks of trees in a wood at Castle Howard, called Mount Sion, but very rare.

Phascum acaulon -
fubulatum } in the sandy part of Bulmer field.

Fontinalis antipyretica in rivers and rivulets.

minor - in rivulets at Hornby and Helmsley.

Splachnum ampullaceum at the east end of Terrington car. I never found it in any other place, and always upon cow's dung.

Polytrichum commune upon heaths and in woods, common.

nanum - upon heaths.

alpinum - on the east side of Raywood at Castle Howard, near the octagon temple, rare.

Poly-

- Polytrichum striatum* - }
 β Dill. musc. t. 55. f. 9. } upon trunks of trees, old paling and
 γ Dill. 432. t. 55. f. 10. } rocks.
 δ Dill. — t. 55. f. 11. }
- Mnium pellucidum* - } in shady woods at Castle Howard, but
androgynum - } not common.
palustre - in Terrington car.
trichomanis - }
fissum - } in shady woods.
- Jungermannia* in Terrington car, amongst the *Sphagnum palustre*; I never saw the fructifications.
- Bryum apocarpum* - upon rocks, trunks of trees, and roofs of houses.
pomiforme - in Bulmer fields.
fontanum - in Terrington car, and near rivulets and springs.
pyriforme - I always found it upon moist heaths.
extinctorium - upon walls, rocks, and sandy banks, but not common.
subulatum - in woods and shady places.
murale - - } common.
rurale - - }
truncatulum - - }
viridulum - - } upon dry sandy banks.
paludosum - in Terrington car, and upon stones in Raywood; but very rare.
undulatum - in woods, and under hedges.
glaucum - - upon heaths; I never could find this moss in fructification.
hypnoides - upon Terrington moor.
 var. of do. - several.

- Bryum scoparium - - in woods and upon heaths.
 heteromallum - upon heaths.
 tortuosum - - upon the rocks at Hornby.
 virens Dickf. fasc. upon rocks at Hornby and Helmsley—
 but rare.
 cirratum - - } common in sandy grounds.
 purpureum - - }
 imberbe - - upon rocks, at Hornby.
 unguiculatum - upon sandy soils.
 tenue barbatum, fo-
 liis angustioribus } in stony places, at Castle Howard.
 & rarioribus, Dill. }
 t. 48. f. 49.
 simplex - - } upon the sides of ditches, on Slingsby
 fericeum - - } moor, and other heaths; but rare.
 carneum - - }
 hornum - - in woods, common.
 annotinum - in Terrington car, and by the sides of
 rivulets in other places.
 aureum - - upon rocks at Hornby and Helmsley.
 argenteum - common.
 var. β - - is rare.
 hygrometricum
 capillare - - } common.
 cæspiticiu[m] - - }
 pulvinatum - - }
 serpyllifolium - - } in shady woods.
 proliferum - - }
 undulatum - - }
 punctatum - in bogs.
 cuspidatum - near springs and rivulets.

Hypnum

- | | | | |
|-------------------|---|---|---|
| Hypnum bryoides | - | - | } in shady woods, frequent. |
| taxifolium | - | | |
| denticulatum | - | | |
| fulvaticum | - | | |
| pennatum, Dickf. | | | } upon trunks of trees in Raywood, but
very rare. |
| fasc. t. 1. f. 8. | | | |
| adiantoides | - | - | in Terrington car, not common. |
| complanatum | | | upon trunks of trees. |
| lucens | - | - | in shady woods near Helmsley, but is
rare to be met with. |
| undulatum | - | - | in Raywood, not common. |
| crispum | - | - | upon rocks at Hornby, but seldom in
fructification. |
| triquetrum | - | - | in woods, and under hedges. |
| rutabulum | - | - | } common. |
| do. varieties | - | - | |
| filiforme | - | - | upon trunks of trees, not common. |
| flicinum | - | - | in bogs, and near springs. |
| proliferum | - | - | } common. |
| prælongum | - | - | |
| parietinum | - | - | |
| plumosum | - | - | upon rocks, and in stony places. |
| Crista castrensis | | | upon the driest rocks, and likewise in bogs. |
| compressum | - | - | } upon trunks of trees, rocks, and in
stony places. |
| cupressiforme | - | - | |
| aduncum | - | - | in Terrington car. |
| scorpioides | - | - | in Terrington car; I never found it any
where else in the neighbourhood: it
flowers in March. |
| viticulofum | - | - | upon rocks, and trunks of trees, in Mow-
thorpe dale. |

Hypnum:

- Hypnum squarrosum }
 loreum - } in woods, hedges, &c. common.
 dendroides - }
 alopecurum - } in shady woods.
 curtipendulum } upon rocks and trunks of trees.
 purum - } upon heaths.
 riparium - } upon stones in rivers and rivulets; this
 Hypnum varies very much.
 cuspidatum - } in bogs and woods.
 fericeum - }
 velutinum - } upon trunks of trees, and stones.
 serpens - } upon stones, is readily distinguished by
 the white calyptra's.
 sciuroides - } upon rocks and trees, not common.
 myosuroides - } upon trunks of trees.
 stramineum, Dickf. } in Terrington car, amongst the Sphag-
 fasc. 6. t. 1. f. 9. } num palustre.
 palustre - } upon stones by Crambe-beck Bridge,
 but rare.
 ornithopodioides, }
 Hudf. gracile, } upon trunks of trees, rare.
 Lightf. - }
 clavellatum - } upon stones, uncommon.
 stellatum, Dickf. }
 fasc. t. 1. f. 7. } in Terrington car.
 Dill. t. 39. f. 42. } upon rocks and stones near Crambe-
 beck.
 Dill. t. 38. f. 33. } in Terrington car.

Algæ.

- Jungermannia asplenoides* } in woods at Castle Howard.
 var. β . Dill. t. 69. f. 6. }
- lanceolata* - by the rivulet at Hornby.
bicuspidata - in woods and shady places.
inflata - in Terrington car, and upon most
 heaths.
bidentata - in shady woods, and under hedges and
 walls.
polyanthos - in a wood at Castle Howard, called
 Cum-hag, not common.
- angulosa*, Dickf. } in some shady woods at C. Howard,
 fasc. p. 7. Dill. } but rare.
 t. 71. f. 22. }
- nemorosa* - in the above woods, not common.
resupinata - in the fissures of rocks at Hornby and
 Helmley.
reptans - - in bogs and moist places, not unfrequent.
albicans - in Raywood, and other woods.
undulata - in bogs, and shady woods.
- pauciflora*, Dickf. } at the east end of Terrington car,
 fasc. 2. p. 15. } amongst the *Sphagnum palustre*.
 t. 5. f. 9. }
- Sphagni* - in the same place as the above; I never
 saw it in fructification.
- platyphylla* in Mowthorpe dale.
tamariscifolia }
dilatata - - } upon trunks of trees, common.
complanata }

Jungermannia

- Jungermannia ciliaris* - I found this beautiful and rare species by the rivulet at Hornby, and in a boggy part of Castle-Howard park, near the keeper's lodge.
- varia* - - in Terrington car, and in woods.
- epiphylla* - in moist and shady places.
- punguis* - - in shady woods, bogs, and by the sides of ditches.
- multifida* - in the same places as the above.
- pusilla* - - I found this rare and minute *Jungermannia* in September 1767, in the shady gravel walks in Raywood, and never saw it any where else; it begins to flower in the Autumn, and continues until the end of March.
- furcata* - - upon rocks and trunks of trees. I have likewise gathered specimens which have the habit of this, but are very hoary; I gave some to my ingenious friend Mr. Dickson, who probably may, by and by, give them a minute examination: I could not find any in fructification, though I have examined them very frequently and at different seasons, and the *J. furcata* is well known to be often met with in flower.
- Anthoceros punctatus* - amongst the grass by the side of the lake at Castle Howard; but very scarce.
- Marchantia polymorpha* } in moist and shady places.
- Do. var. β . - - }

Marchantia

- Marchantia conica* - - by the sides of rivers, and ditches.
hemisphærica in Terrington car, and upon moist rocks
at Hornby and Helmsley.
- Riccia glauca* - - in shady parts of Raywood.
minima - - with the former, but rare.
fruticulosa, Dickf. } upon the trunks of trees in Raywood. I
fasc. p. 8. - } never met with this beautiful moss
any where else.
- Lichen scriptus* - - }
carpineus - - }
fagineus - - } upon trunks of trees.
subfuscus - - }
rugosus - - }
- ericetorum* - - upon heaths.
lacteus - - upon rocks at Hornby.
calcareus - - upon heaths.
sphæroides Dickf. } upon barren heaths, and rocks.
fasc. p. 9. - }
- canescens*, Dickf. } upon trunks of trees.
fasc. p. 9. - }
- candelarius* - upon walls and trees.
tartareus - - upon rocks about Hornby and Helmsley,
but rare.
- rufus* - - upon heaths.
ater - - upon trunks of trees, and old paling.
parellus - - upon heaths and rocks.
pallefcens - - upon trees.
faxatilis - - }
parietinus - - } upon trunks of trees and rocks.
olivaceus - - }
stellaris - - }

- Lichen granulatus* - amongst rocks, rare.
omphalodes - upon the rocks at Hornby and Helmfley,
but rare.
phyfodes - - upon the park pales of Castle Howard,
but not frequent.
ciliaris - - }
perlatus - - } upon trees, common.
pulmonarius - - }
farinaceus - - }
prunastri - - }
fraxineus - - }
glaucus - - } upon the park paling at Castle How-
furfuraceus - - } ard, but rare.
islandicus - - upon Terrington, Stockton, and Earsley
moors.
hispidus, Lightf. with the above.
verrucosus, Hudf. } upon trees in Coneythorpe banks,
i. e. scrobiculatus, Lightf. } a large wood at C. Howard, rare.
Lichenoides hispidum minus }
et tenerius, scutellis nigris, } upon trees and pales.
Dill. t. 20. f. 46. - - }
calicaris - - upon old paling, but very rare.
tremelloides - amongst the moss upon rocks at Horn-
by, not frequent.
caperatus - - upon trunks of trees, particularly the
beech and ash.
fasciculatus, Lin. upon old gravel walks at Castle How-
ard.
caninus - - }
fylvaticus - - } common.

Lichen horizontalis	-	-	in woods, not common.
miniatus	-	-	upon rocks in Mowthorpe dale.
cocciferus	-	-	} upon heaths.
cornucopioides	-	-	
pyxidatus	-	-	
fimbriatus	-	-	
gracilis	-	-	
digitatus	-	-	
ventricofus	-	-	
cornutus	-	-	} in woods, and upon heaths.
difformis	-	-	
rangiferinus	-	-	} in woods, and upon heaths.
fylvaticus	-	-	
globiferus	-	-	upon rocks in Bilfdale, rare.
uncialis	-	-	} upon heaths.
fubulatus	-	-	
plicatus	-	-	upon trees; I gathered specimens of this in Coneysthorpe banks, near two feet long.
hirtus	-	-	upon trees.
floridus	-	-	upon trees, but rare.
Tremella Nostoc	-	-	} common.
Auricula	-	-	
Ulva cornuta	-	-	upon stones in rivulets, rare.
Ulva terrestris tenerrima	-	-	} in shady places.
viridis crispa, R. Syn.	-	-	
Conferva rivularis	-	-	} in rivers, common
canalicularis	-	-	
gelatinosa	-	-	upon the stones in the rivulet at the bottom of Castle-Howard park.

Byssus incana
 lactea
 velutina
 and many others.

Fungi.

Agaricus chantarellus

integer

muscarius

lactifluus -

piperatus -

campestris -

viscidus -

clypeatus -

androsaceus -

quercinus -

pectinatus -

Boletus versicolor -

albus -

igniarius -

bovinus -

luteus -

Hydnum imbricatum - under the large beeches in Raywood,
 rare.

Elvela Mitra - - with the above, rare.

Phallus esculentus - - generally under ash trees.

Peziza lentifera -

punctata -

Acetabulum -

cyathoides -

scutellata -

} common.

}

Clavaria

Clavaria pistillaris
ophioglossoides
digitata
hypoxylon
coralloides
muscoides

Lycoperdon Bovista

pedunculatum

stellatum - - upon sandy banks near Ganthorpe,
but rare.

XVI. *Observations on the British Species of Carex.* By the Rev. Samuel Goodenough, L.L.D. F. R. S. Tr. L. S.

Read April 3, 1792.

THE plants arranged under the genus of *Carex*, seem always to have laboured under some degree of obscurity and difficulty. They were generally ranked, by the older botanists, under a very unmeaning name, *Cyperoides*; and having no striking virtues to recommend them, they were spoken of in an indistinct method, and were in a manner passed over as things unworthy of laborious investigation. In the third edition of Ray's Synopsis, *Cyperoides*, including *Cyperus*, answers to our genus *Carex*; the thing likened including and referring to itself for its original! The general character is, *Caules triquetri in omnibus, & in plerisque etiam semina*: a description very indefinite. Morison and Scheuchzer, to whose consummate accuracy his *Agrostographia* will be a *monumentum ære perennius*, observe, with respect to our genus of *Carex*, nearly the same method as Ray. I say nothing of the more ancient writers, especially Gerard and Parkinson; for their works, being in English, are not so universally known. All these authors pursued in fact nearly the same plan; and thus some species of *Scirpus*, *Schænus* and *Cyperus*, and all the species of *Carex* (so vague was their generic character) were comprised under one name, *Cyperoides*, and formed one jarring family.

In

In the beginning of the 18th century, *Ruppius*, *Monti*, *Jussieu*, and *Michelius*, divided the *Carices* of *Linnaeus* into two families. *Michelius*, who deserves most consideration, divides them into *Cyperoides* and *Carex*. Under the former division he classes the Linnean species which have *spicas sexu distinctas*, and under the latter those which have *spicas androgynas*: but, in doing this, he ranks *Carex dioica* under the former. I shall have occasion presently to speak of this division more particularly.

Tournefort, intent upon the corolla, gave a decisive character taken from that interesting feature. He speaks however only of twenty-three species, of which almost all are of the order *Sexu distinctæ*. But even in this arrangement he offends against his own generic character: for he describes his genus (which he styles *Cyperoides*) as having its terminal spike barren, and the inferior ones fertile; a description by no means according with the androgynous species.

Linnaeus thought it needless to extend his generic character to any farther degree of minuteness than what the nature of the flowers called for. The situation of the flowers was disregarded by him: it was sufficient for his purpose that the presence of male and female flowers determined their place in the class *Monœcia* of his system, and the parts of fructification determined the genus *Carex*.

Whether *Linnaeus*'s generic character be sufficiently exact, and whether, from the multitude of modern discoveries, it may not be advisable to restore the old division into two families, may possibly admit of some doubt. *Linnaeus* describes the Nectarium (by which he means the capsule or tunica enveloping the seed, for he alludes indifferently to all these three terms) as *inflatum tridentatum*, and the stigma as trifid. Supposing *tridentatum* to be an error of the press for *bidentatum*, still even then a large portion of the family will
not

not accord with either of these characters. Perhaps the fault lies in including those with androgynous spikes, and those whose spikes are distinct in point of sex, in one family. But this carries me back to *Michelius*, one of the first who made a separation between them.

It is true that *Michelius*, by dividing and subdividing his families into so many orders, rather obscured the subject by his laborious particularity. But still his primary division into two families merits some consideration; for it seems a natural one. For, independent of the situation of the different flowers, all the androgynous species, except *C. pauciflora*, have their stigma bifid; and the rest, except three or four, trifid. Perhaps *Linnaeus*, though aware of this circumstance, had not carefully attended to it in forming his generic character. Be that as it will, this constant difference of the principal part of fructification, together with their outward habit (certainly very discordant), might have warranted their being retained as distinct genera; for the most ingenious artificial system appears to most advantage when most consonant with nature. What affinity is there in appearance between *C. dioica* and *riparia*, *C. vulpina* and *capillaris*? Nothing can be more dissimilar in habit, in nature, and œconomy. We all allow how impolitic it is to multiply genera without a sufficient cause. Equally impolitic is it to overload any genus with numerous species, which would naturally divide themselves into distinct families. Perspicuity is the end of system; and that is best attained by avoiding each extreme. I have not, however, ventured to separate them into two families. The British species, though numerous, do not absolutely require it: but I can easily conceive, that when all the known species of the world are brought together, some such division will contribute very much to the neatness of the system, and ease of the student. I throw out these hints, not presuming to direct, but wishing rather to excite
and

and collect the thoughts of such as may be willing to turn their minds to this subject.

But however it is not so much to my present purpose, to enter very minutely into the generic character; that is a point to be reserved for future consideration: I am rather anxious to define the species of this family. When I first began to study them, I met with more difficulties than I had reason to apprehend. In the adoption of synonyms, *Linnaeus* himself has made some blunders of consequence: Mr. *Hudson's* *C. spicata*, is the *C. muricata* of *Linnaeus*—but *Linnaeus*, in quoting his synonyms, selects some expressive of Mr. *Hudson's* *spicata*, and others of his *muricata*: so also, thinking them to be the same, he quotes *Morison's* figure of *recurva* to his *cæspitosa*. I could mention more instances of the same kind.

Again, there has always prevailed an idea of the many varieties of the several species; a supposition by no means well founded.—Thus *Linnaeus* makes *sylvatica*, *vesicaria* and *ampullacea* varieties of each other. Thus also, *riparia*, *paludosa*, and *acuta*, have most unaccountably, by many authors, been looked upon as partakers of the same origin. The accurate Mr. *Curtis* first noted their respective limits.

As *Linnaeus*, not always having the whole plant before him, could not form any discriminating character from the root, so few of his followers have done it; whereas, in many of the species, it is of importance to know the root. Thus, when we know that *dioica* has a creeping root, and *pulicaris* a fibrous one, we are at once enabled to distinguish them in any stage of growth: their spikes at their first formation are often similar.

But the greatest perplexity to be met with arises from the Linnean division into spikes sessile and pedunculated: cultivation, or, in a natural state, a casual luxuriant growth, does away the whole distinction. Thus *C. distans* always has its spikes on long footstalks;

but these being embraced by the petiolus or vagina of the foliaceous bractæ, gave occasion to *Linnaeus* to style them subseffile. But the least injury to the vagina would discover the footstalk, and perplex the young student beyond description. This latter difficulty principally induced me to have recourse to a new mark of discrimination, which appeared to be less liable to variety than most others: I mean the proportion which the petiolus or vagina of the foliaceous bractea, in the orders *spicis sexu distinctis*, bears to the footstalk on which the spike is supported. This mark will always hold out something worthy of observation; for if the footstalk be unusually long or short, in consequence of the luxuriance or barrenness of the soil, the vagina will be found to be affected somewhat in the same proportion.

In general, the proportion between the parts in the animal and vegetable kingdoms is less liable to variation than most other circumstances. Observing, therefore, how constant the length of the vagina was to that of the footstalk, I determined to take my leading character from it. Having begun to do so in some instances, I at length became compelled to adopt it in all; *idem enim in omnibus notandum est*. And I beg leave to offer this principally as my apology for constructing new descriptions throughout. Spikes being said to be seffile which were not so, called necessarily for new descriptions: this led on to a change in the description of their affinities, and thence onward, so that there was no stopping.

It is not to be expected, neither is it necessary, or indeed possible, in the short space of a specific description, to comprehend all the niceties of discrimination which a more leisure survey will point out; and yet many of these must strike every observer, and must be very serviceable to him in the pursuit of his enquiries. I will beg leave to suggest a few of them. Although some *Carices* are said to have one male spike only, and others more than one, yet some of the

the former order will be found most frequently to have two, as is the case particularly with *stricta* and *filiformis*.

The shape of the spikes is worth attending to. Observing *C. pilulifera* with round female spikes, we in most stages of growth can separate it from *C. præcox*: should any doubt be still entertained, as may happen in their infancy, the thin male spike of *pilulifera* will make an appearance quite different from the obovate or rather club-shaped one of *præcox*. The filiform slender female spikes of *C. acuta* make us wonder how it ever could be classed with the corpulency of *C. riparia*.

The shape of the glumæ, or, as they are often called, squamæ, affords, in many instances, a very characteristic mark, in none more so than in *C. rigida*.

The pendulosity of the spikes is also an interesting circumstance. However, in the judging of this circumstance, the state of the fructification must be considered: for many whose spikes are described to be pendulous, betray that circumstance only in the advanced state of fructification, as *C. recurva*: some only in the early and not in the riper age, as is frequently the case with *C. acuta*.

As *Linnaeus* founded his system upon the parts of fructification, it may seem strange that he was not more particular in noting the variation of the number of the stigmata. Perhaps his describing from dried and imperfect specimens occasionally prevented him from examining into this circumstance. Thus, *C. rigida* is readily discriminated from *præcox* by its having only two stigmata. The digynous appearance in the flowers of *acuta*, is its primary mark of separation from *C. paludosa*. I must observe, when *Linnaeus* described his *caespitosa* in the *Fl. Suecica*, he referred to a plant in *Scheuchzer*, which had three stigmata. He excluded this synonym afterwards in his second edition of *Sp. Plant*.

In all plants the fruit is a leading circumstance. The capsule,

or, as it is often called, but I doubt whether with propriety, the nectarium, must be often called in to aid the description of *Carices*. The capsule is oblong, as in *pallefcens*; round, as in *pilulifera*; rostrated, as in *Pseudo-Cyperus*; smooth, as in *panicea*; downy, as in *præcox*; villous, as in *filiformis* and *hirta*; divided at the summit, as in *muricata*; entire, as in *stellulata*.

In a few species the foliaceous bractææ have little auricles at each side of their base, as is particularly observable in *stricta*, *cæspitosa*, *rigida*, and *acuta*. The length of the foliaceous bractææ is inconstant, and therefore must be admitted into descriptions with extreme caution. *C. arenaria* of Linnæus, and *C. divisa* of Mr. Hudson, are described by *spicis foliolo longiori instructis*; whereas nothing is more common than to find them with exceedingly short bractææ, and sometimes with none at all.

But above all modes whereby the distinction of plants is best discovered, cultivation and attention to the progress of their growth is the most useful. Beyond almost all other plants, our patience is required in the investigation of the grasses. When *Carices* are found in unnatural situations, it is impossible almost to be aware of the appearances which they will put on. On the high ground above Virginia water, I found *C. ovalis* with one male oblong spike, neither could I learn its name till I had cultivated it. *C. præcox*, on Hanwell heath, appeared with only one terminal female spike. These are irregularities which cultivation alone can detect. A good botanist will not be satisfied till he can ascertain his plants in all their stages. It is not less useful than satisfactory to know the grasses, even independent of their flowers: *C. limosa* not unfrequently produces no flowers; in this state, it has the singular property of throwing out long, branching, trailing shoots, which may be made to produce new plants by layers, or even by cuttings. Many more niceties of the same kind might be mentioned, but I forbear lest I should seem tedious.

Of

Of the uses of this tribe of plants all authors almost are silent. The older botanists declare themselves ignorant of any good to be derived from them: perhaps they looked only to the fattening of their cattle; but here it must be allowed,

Nec bos pinguescat malè carice pastus acutâ.

Linnaeus, in his *Fl. Lappon.* adds an entertaining note to his description of *C. sylvatica*, wherein he tells us, that the Laplanders comb and dress this grass, as we do flax: when it is thus made soft, they stuff their gloves and shoes with it, to defend them from the piercing cold of their severe winters: so effectually are they secured by this covering, that chilblains are not known amongst them. In summer also the use of the same material is retained. The Laplander, unused to every species of luxury, having his shoes made of skins, not leather, is defended by this means from the bruises which he would receive in his travels, as he tends his flocks; and moreover, escapes the inconvenience of the heat—*sudorem enim pedum arcet*. It is not this grass only, but a variety of grasses are worked up in this manner. *Linnaeus* however observed that they were chiefly *Carices*, and of the *Carices* chiefly the *C. sylvatica*.

Mr. *Lightfoot*, speaking of *C. riparia*, which he calls *acuta*, observes, that “in Italy its leaves are used by the glass-makers to bind their wine flasks, by the chair-makers to bottom chairs, and by the coopers to place between the junctures of the timber in the heads of their casks, in the same manner as the leaves of the *Typha* are used in the same country, and the stalks of the *Scirpus lacustris* in England.” *Fl. Scot.* p. 566.

The young foliage and the flower-stalks of those *Carices* which grow on heaths, and where there is an abundance of cattle, are observed to be eaten off; of course they are not wholly without use. All *Carices* affect a very moist situation, and of course, in all
pro-

probability, will yield an early foliage, and in times of drought a fure one. - There may be countries where this circumstance may be worthy of confideration: the large coarfer forts might be worked up in all countries, with other materials, for thatching, and for the coarfer purpofes of covering and protecting againft weather. All thofe *Carices* which have creeping roots, are admirably well qualified to give ftability and firmnefs to the furface of quaking bogs. Many of this fort alfo grow by the fides of ditches and rivers, and occafion a tenacity in the banks, fo that they can refift the violence of currents. Cattle are not fond of thefe; perhaps fortunately fo, that man may more furely, as *Linnaeus* has remarked, receive benefit from their growth in places of this nature.

I do myfelf the honour of laying thefe obfervations before the Linnean Society, anxious to facilitate the knowledge of this difficult genus; hoping at the fame time that others will improve upon them, and at length conftitute characters more diftinctive than mine. They are the obfervations of folitary walks, and of hours which, through the prevalence of modern fafhion, feem as it were privileged to be fpent in nothingnefs. But the contemplative philofopher, even in thefe, finds the moft folid delight in dwelling upon the works of the Almighty; and while he views “the things that are made,” he confirms himfelf (and it is the true end of the ftudy of nature) in the belief “of his eternal power and godhead,” and of the revelation (for it is a natural deduction) which he hath given of his will.

Obfervation I. Having, for brevity's fake, introduced a new term—*Vagina*—into many of my descriptions, I beg to define it thus:

Vagina eft basis folii vaginantis.

The

The culm of most grasses has what *Linnaeus* terms *folia vaginantia*. Some authors have called leaves of this sort petiolated leaves, but I think improperly: they are better defined *sheathing leaves*, for they embrace or inclose the stalk at their base. This sheath or vagina in the *Carices* usually bears a regular proportion to the length of the foot-stalks of the spikes: I call it, either *aequans*, when of the same length as the foot-stalk; *dimidiata*, when half of the length; *abbreviata*, when of a quarter of the length.

Obs. 2. I have purposely omitted mentioning the seed, not having as yet been able to examine it in a fresh state, in all the species.

Obs. 3. Where a plant is said to have vaginae, the spikes are necessarily on foot-stalks (for the application of that term is to the floral leaf embracing the whole or part of the foot-stalk or peduncle); and therefore no mention of that circumstance is necessary in the several specific descriptions.

SYNOPSIS SPECIERUM.

Spicâ unicâ simplici.

1. *C. dioica.* Spicâ simplici dioicâ, capsularum marginibus ferrulatis.
2. *C. pulicaris.* Spicâ simplici androgynâ superne masculâ, capsulis divaricatis retroflexis utrinque acuminatis.
3. *C. pauciflora.* Spicâ simplici androgynâ, floribus foemineis subternis remotiusculis patentibus; masculo sub-unico terminali.

* *Spicâ compositâ androgynâ.*

4. *C. stellulata.* Spiculis subternis remotis, capsulis divergentibus acutis: ore indiviso.

5. *C. curta.*

5. *C. curta*. Spiculis subsenis ovatis remotiusculis nudis, squamis ovatis acutiusculis capsulâ brevioribus.
6. *C. ovalis*. Spiculis subsenis ovalibus approximatis alternis, squamis lanceolatis acutis capsulam æquantibus.
7. *C. remota*. Spiculis axillaribus folitariis remotis sessilibus, foliolis longissimis, capsulis apice indivisis.
8. *C. axillaris*. Spiculis axillaribus subternatis remotis sessilibus, foliolis longis, capsulis apice divisis.
9. *C. incurva*. Spicâ conicâ spiculis plurimis congestis sessilibus compositâ, involucro nullo, culmo incurvo.
10. *C. arenaria*. Spicâ foliosâ oblongâ acutiusculâ; spiculis plurimis: terminalibus masculis: inferioribus foemineis, culmo incurvo.
11. *C. intermedia*. Spicâ oblongâ obtusâ; spiculis plurimis: infimis terminalibusque: foemineis intermediis masculis, culmo erecto.
12. *C. divisa*. Spicâ ovatâ sub-decompositâ, foliolo erecto instructâ, spiculis subconfertis, capsulis adpressis, radice repenti.
13. *C. muricata*. Spicâ oblongâ sub-decompositâ, spiculis distinctis, capsulis divergentibus: ore diviso, radice fibrosâ.
14. *C. divulsa*. Spicâ elongatâ decompositâ basi sub-ramosâ; spiculis inferioribus remotis: summis contiguis, capsulis sub-erectis.
15. *C. vulpina*. Spicâ supradecompositâ coarctato-ramosâ obtusâ; spiculis supernè masculis, capsulis divergentibus, culmi angulis acutissimis.
16. *C. teretiuscula*. Spicâ supradecompositâ coarctato-ramosâ acutiusculâ; spiculis supernè masculis, capsulis patentibus, culmo teretiusculo.
17. *C. paniculata*. Spicâ supradecompositâ paniculato-ramosâ acutâ: ramis alternis remotiusculis, capsulis patentibus, culmo triquetro.

* *C. atrata*.

** *Spicis*

** *Spicis sexu distinctis: masculâ unicâ: bracteis membranaceis.*

18. *C. digitata*. Bracteis membranaceis subaphyllis vaginantibus dimidiatis, spicis linearibus erectis; masculâ breviori, capsulis distantibus.
19. *C. clandestina*. Bracteis membranaceis subaphyllis vaginantibus, spicis foemineis oblongis remotis vaginam vix exsuperantibus.

*** _____ : _____ : *bracteis foliaceis, & plerumque vaginantibus.*

20. *C. pendula*. Vaginis longis subæquantibus, spicis cylindricis longissimis pendulis, capsulis ovatis acutis.
21. *C. strigosa*. Vaginis longis subæquantibus, spicis filiformibus laxis pendulis, capsulis oblongis subtriquetris acutis.
22. *C. præcox*. Vaginis brevibus subæquantibus, spicis approximatis; masculâ sub-clavatâ; foemineis ovatis, capsulis subrotundis pubescentibus.
23. *C. filiformis*. Vaginis brevibus subæquantibus, spicis masculis sub-duabus linearibus; foemineis ovatis remotis, capsulis hirtis.
24. *C. flava*. Vaginis brevibus subæquantibus foliolo divaricato, spicâ masculâ lineari; foemineis subrotundis, capsulis rostrato-acuminatis.
25. *C. extensa*. Vaginis brevissimis æquantibus foliolo sub-reflexo, spicis confertis; foemineis subrotundis, capsulis ovatis acutis.
26. *C. fulva*. Vaginâ infimâ subdimidiatâ; superioribus subæquantibus, spicis foemineis duabus oblongis acutis, capsulis rostrato-acuminatis.
27. *C. distans*. Vaginâ infimâ ferè dimidiatâ; superioribus subæquantibus, spicis oblongis remotissimis, capsulis acutis.

28. *C. panicea*. Vaginâ infimâ sub-dimidiatâ; superioribus sub-æquantibus, spicis linearibus remotis, capsulis inflatis sub-distantibus obtusiusculis.
29. *C. capillaris*. Vaginis dimidiatis, spicis fœmineis oblongis laxis; fructiferis pendulis, pedunculis capillaribus, capsulis acuminatis.
30. *C. depauperata*. Vaginis plusquam dimidiatis, spicis fœmineis remotis paucifloris, capsulis inflatis ovatis rostrato-acuminatis.
31. *C. sylvatica*. Vaginis abbreviatis, spicis filiformibus laxis pendulis, capsulis ovatis aristato-rostratis.
32. *C. recurva*. Vaginis abbreviatis, spicis fœmineis sub-cylindricis pendulis, capsulis rotundato-ovatis, radice repenti.
33. *C. pallescens*. Vaginis abbreviatissimis, spicis fœmineis sub-cylindricis; fructiferis pendulis, capsulis subtriquetris oblongis obtusis.
34. *C. limosa*. Vaginis abbreviatissimis sub-nullis, spicis fœmineis ovatis pendulis, capsulis ovatis compressis, radice repenti.
35. *C. Pseudocyperus*. Vaginis sub-nullis, spicis fœmineis cylindricis pedunculatis pendulis, capsulis nervosis oblongis aristato-rostratis sub-divaricatis.
36. *C. atrata*. Vaginis sub-nullis, spicis omnibus androgynis, pedunculatis: fructiferis pendulis, capsulis ovatis acutiusculis.
37. *C. pilulifera*. Vaginis nullis, spicâ masculâ sub-lineari; fœmineis confertis subrotundis sessilibus, culmo debili.
38. *C. rigida*. Digyna, vaginis nullis, spicis oblongis subsessilibus, foliis sub-recurvis rigidis.
39. *C. cæspitosa*. Digyna, vaginis nullis, spicis subsessilibus sub-cylindricis obtusis, foliis erectis molliusculis.
40. *C. stricta*. Digyna, vaginis nullis, spicis subsessilibus cylindricis acutis; masculis sub-duabus, foliis erectis strictis.

**** *Spicis*

**** *Spicis sexu distinctis, masculis pluribus.*

41. *C. riparia*. Spicis oblongis acutis; masularum squamis lanceolatis: foeminearum aristato-acuminatis, capsulis ovato-lanceolatis apice furcato-dentatis.
 42. *C. paludosa*. Spicis oblongis sub-obtusis; masularum squamis obtusis: foeminearum lanceolatis, capsulis ovato-lanceolatis apice sub-dentatis.
 43. *C. acuta*. Digyna, spicis filiformibus; foemineis inflorescentibus nutantibus: fructiferis erectis, capsulis acutiusculis apice indivisis.
 44. *C. vesicaria*. Spicis masculis linearibus; foemineis oblongis patentibus, capsulis inflatis oblongis rostrato-acuminatis patentibus.
 45. *C. ampullacea*. Spicis filiformibus; masculis tenuioribus; foemineis teretibus erectis, capsulis inflatis globosis aristato-rostratis divaricatis.
 46. *C. hirta*. Pilosa, spicis omnibus oblongis; foemineis remotis vaginatis: vaginis hinc lanato-villosis, capsulis hirtis.
- * *C. filiformis, stricta, recurva; & quædam aliæ, quæ aliquando spicis masculis duabus, sed rariùs sunt notabiles.*

I. CAREX DIOICA.

C. Spicâ simplici dioicâ, capsularum marginibus ferrulatis. Buddle Hort. Sic. p. 32. n. 5.

Gramen cyperoides minimum spicâ simplici cassâ. *Hist. Ox. III. 244. f. 8. t. 12. f. 22. mas.*

Gramen cyperoides minimum ranunculi capitulo rotundo. *Hist. Ox. III. 245. f. 8. t. 12. f. 36. foemina.*

Cyperoides parvum, n. 1 & 2. *Mich. Gen.* p. 56. t. 32. f. 1 & 2.
Scheuchzer, 497. t. 11. f. 9 & 10.
Fl. Suecica, n. 833. *Fl. Angl.* p. 401. *Fl. Dan.* 369. *mas* & *fœmina*.
Fl. Scot. 541. *Withering*, p. 1026.

Habitat in palustribus spongiosis. Junio.

DES. *Radix* repens, perennis. *Folia* fetacea, sub-triquetra, intus canaliculata, erecta, culmum floriferum sub-æquantia, glabra. *Culmus* tenuis, erectus, triqueter, angulis acutiusculis, glaber, 4—10 uncialis, foliis demum paulò longior. *Spica* mascula oblonga, bractea brevi ovata fusca in mucronem desinenti, $\frac{1}{2}$ —1 uncialis; squamis oblongis acutiusculis fulvis, nervo dorsali obsoletiusculo viridi. Filamenta tria; antheræ lineares flavæ. *Spica* fœminea oblonga demum subcylindrica, squamis ut in mascula, capsulâ brevioribus. *Capsulæ* sæpius sub-distichæ, patentes, ovatæ, acutæ, marginibus apicem versus minutissimè ferrulatis, ore integro. Stigmata duo.

So great a similarity prevails between what are called *C. dioica* and *capitata*, that no author has as yet struck out a constant satisfactory difference of character. Mr. *Hudson*'s introduction of *Linnaeus*'s *C. capitata* into the catalogue of British plants, has excited an enquiry into the reality of that species, and in particular with respect to its being a native of Britain. Indeed the difference between them at most seems very trifling. In *C. capitata* the spike is round, and somewhat (owing to the male flowers at the top) conic: in the female *C. dioica*, it is ovato-oblong. The capsules seem broader in *capitata*. In *dioica* the capsules are most minutely ferrated towards the point; in *capitata* they are entire. In *dioica* the capsules are striated with nerves, which can scarcely be said to appear in the very few specimens of *capitata* which I have seen. I have found the male *dioica* with a female flower

flower or two at the base of the spike, the capsules of which very much resemble those of the Swedish *capitata*. In *Uvedale's Herbarium Rayanum*, vol. 12. fol. 68. n. 5. and in Mr. *Lightfoot's* herbarium, to which I had access, through her MAJESTY'S most gracious condescension, who is now the possessor of it, are specimens of the female *dioica*, with several male flowers at the top of the spike. The leaves in both species are exactly the same; the style in each has two stigmata. I have seen capsules in *dioica* where there is no visible ferrulation on the edges. Swedish specimens of *capitata* are in the rich herbaria of Sir *Joseph Banks* and Dr. *Smith*. All my ideas of the plant are taken entirely from them.

The synonyms of *Ray* and *Morison*, which *Linnaeus* quotes for *capitata*, are undoubtedly to be referred to *C. dioica*. He himself referred them to it in *Fl. Suecica*. In the places so particularly mentioned by those authors, *C. dioica* and that only has ever been found.

The different figures of *Michelius* have led into some error.—I do not hesitate to say, that the female figure No. 1. is carelessly drawn: its being represented with three stigmata, instead of two which it ought to have (as is evident from a specimen in Mr. *Lightfoot's* herbarium), is a sufficient proof of it. This is that Irish variety mentioned by *Ray*, in his *Synopsis*, p. 425, n. 66. In *Michelius's* figure, n. 2. no male flowers are to be seen at the summit: neither are they in *Morison's* figure, n. 36. These figures are both very decent representations of the female *dioica*: they bear no similarity to the specimens of *capitata* mentioned before.

Scheuchzer's figure seems like *pulicaris*, rather than *dioica*. It is possible he may have confounded the two together, as any one might do in their infant state.

Upon the whole, therefore, I can see no reason why *C. capitata* should be continued as a British species, and therefore have excluded it.

I do

I do not pretend to be the *first* discoverer of the difference of the capsule in *capitata* and *dioica*, as mentioned above.—Dr. *Smith*, long before I had the happiness of his acquaintance, had, unknown to me, communicated it to some of his friends. As his herbarium must be considered as the fountain-head of all botanical authority, I was particularly happy in the coincidence of his opinion, and, in deference to it, added to the specific description of *C. dioica*, *capsularum marginibus ferrulatis*.

2. CAREX PULICARIS.

Spicâ simplici androgynâ superne masculâ, capsulis divaricatis retroflexis utrinque acuminatis. *Uvedale, Herb. Rayn.* vol. 12. p. 68. n. 3.

Carex minima. *Mich. Gen.* 66. t. 33. f. 1.

Gramen cyperoides minimum, &c. *Morif. Hist. Ox.* III. p. 244. f. 8. t. 12. f. 1. *Pluk. ph.* t. 24. f. 10.

Fl. Lapon. n. 339. *Leers*, 198. t. 14. f. 1. *Fl. Ang.* 402. *Fl. Scot.* 543. *Fl. Dan.* 166.

Habitat in paludibus turfosis & limosis. Junio.

Radix fibrosa, perennis. *Folia* setacea, saturatè virentia, rigida, glabra, erecta, culmo breviora canaliculata, hinc convexiuscula & nervoso-angulata. *Culmus* erectus teretiusculus glaber 3-12 uncialis. *Spica* simplex, cylindracea, terminalis. Flores masculi plurimi superiores, foeminei circiter totidem inferiores laxè imbricati. Squamæ subfuscae, ovatae, acutae, capsulâ breviores, nervo dorsali viridi, deciduae. *Capsulae* ovatae utrinque acuminatae, trigonae, glaberrimae, mox divaricatae, demum pendulae ore integro. Filamenta tria; antherae lineares flavae. *Stigmata* duo.

Obs. Squamæ florum masc. obtusiores quam foemin.

This plant is so very distinct in itself, and is so well distinguished by

by all authors, that there is no necessity of adding to the general mass of description.

He who would wish to peruse good descriptions of it, would do well to consult Mr. *Lightfoot's Flora Scotica*, and Mr. *Leers's Flora Herbornensis*—a book which ought to be in the hands of every botanist who wishes to enter into a practical study of his subject.

The figure in *Morison* is extremely characteristic.—*Leers* gives the plant in both a young and mature state, together with all the parts of fructification.—*Michelius's* figures in general are to be depended upon—but he is not faultless in his adapting of synonyms: he quotes *Mor.* figure 22, which is the male dioica, to this plant.

3. CAREX PAUCIFLORA.

C. spicâ simplici androgynâ, floribus fœmineis subternis remotiusculis patentibus; masculo sub-unico terminali. Lightfoot, Fl. Scot. 543. tab. vi. f. 2.

C. patula. Hudf. Fl. Ang. 402. Withering, p. 1027.

Habitat in ericetis montosis.

I have never had an opportunity of cultivating this species, or of seeing it alive, or even in a fresh state.

Mr. *Hudson* and Mr. *Lightfoot* have both described this plant. Their descriptions, although they differ in their mention of the number of the flowers, yet agree very well in setting forth the general habit of the plant, and the situation of the male and female flowers.

Mr. *Lightfoot* has given an excellent figure. As his publication was prior to Mr. *Hudson's*, and as his name is more expressive (and that is no slight object), I am an advocate for restoring the name *pauciflora*.

I take

I take the following description from specimens in Sir *Joseph Banks's* herbarium, transmitted by Mr. *Lightfoot*. Mr. *Lightfoot* favoured me also with several specimens, which entirely accord with Sir *Joseph's*.

Radix ———

Folia erecta, glabra, triquetra, culmo breviora.

Culmus 3-5 uncialis, præterquam ad basin nudus, triqueter, glaber.

Spica androgyna, simplex, laxa, floribus circiter quinque, quorum ultimus masculus. Squamæ elongatæ, lanceolatæ, acutæ, longitudine capsularum.

Capsulæ ———

Styli tres. An hoc semper?

4. CAREX STELLULATA.

C. spiculis sub-ternis remotis, capsulis divergentibus acutis, ore integro. *Buddle Hort. Sic.* p. 32. *Uvedale Herb. Ray.* vol. 12. p. 68. n. 1.

Carex spicis ternis echinatis, glumis lanceolatis, capsulæ mucrone simplici. *Haller Hist.* 1366.—*Raii Synops.* 424. n. 12.

Gramen cyperoides echinatum minimum: *Park.* 1272. *Morif. Hist. Ox.* III. 344. f. 8. t. 12. f. 26.—*Leers,* t. 14. f. 8. opt.—*Scheuchzer* 485. t. 11. f. 3.

Carex muricata. *Huds. Fl. Angl.* 406. *Fl. Scot.* 549. *Fl. Dan.* 284. *With.* 1034.

Habitat in palustribus. Maio, Junio.

Radix fibrosa, perennis. *Folia* pallidè viridia, erectiuscula patula, ad margines carinasque, præcipuè apicem versus aspera, angusta. *Culmus* sub inflorescentiâ circiter 3-uncialis erectus foliis duplo brevior,

brevior, triqueter, angulis obtusiusculis obsolete asperiusculis, mox pedalis & foliis longior. *Spica* composita androgyna, spiculis subternis, remotis, ovatis, sessilibus: ad spiculam inferiorem sæpius bractea, basi ovata, in foliolum setaceum culmo brevius desinens; ad cæteras oblonga est, membranacea, fusca, aphylla. *Flores* inferiores masculi laxius imbricati, superiores foeminei plures. Squamæ ovatæ, acutæ, fuscæ, margine membranaceo albo, nervo dorsali lato viridi, capsulâ maturâ breviores. *Capsula* oblonga acuminata, hinc plana, illinc convexiuscula, divergens, apice acuto sub-indiviso. *Filamenta* tria, antheris linearibus flavis. *Stylus* stigmatibus duobus.

This little plant is well known to every botanist. It stands in competition with none of its fraternity, and therefore cannot be mistaken.

It varies in height from three to ten inches, according to its soil and situation. On the Brecknockshire hills I have found it above a foot high.

A floral leaf sometimes, but by no means constantly, subtends the lowest spicula.

It is well observed by *Haller*, that this species differs from *muricata*, by having the point of the capsule acute, and not bifid.

5. CAREX CURTA.

C. spiculis subternis ovatis remotiusculis nudis, squamis ovatis acutiusculis capsulâ brevioribus.

Gramen cyperoides spicis curtis divulsis. *Loesel. Pruss.* p. 117. t. 32.

C. elongata, *Leers*, p. 200. t. 14. f. 7.

C. canescens, *Lightfoot, Fl. Scot.* p. 550.

C. brizoides, *Huds. Fl. Angl.* p. 406.

C. cinerea, *Withering*, p. 1033.

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U

Habitat,

Habitat, sed rarius, in palustribus & aquosis. Junio.

Radix sub-repens, perennis. *Folia* pallida sub-glaucæ, ad margines carinamque aspera, erecta angusta. *Culmus* pedalis aut paulò altior, foliis paulò longior, erectus, triqueter, angulis acutis asperiusculis. *Spica* composita androgyna, spiculis sex & ultra, erectis ovatis sessilibus alternis; ad spiculam inferiorem bractea, sed rarius, foliaceâ fetacea, ad cæteras ovata alba tenera membranacea. *Squamæ* albæ membranaceo-sericeæ, ovatæ, acutæ, concavæ, nervo dorsali viridi, capsulâ paulò breviores. Flores inferiores masculi. *Capsula* ovata, acuta; hinc plana, illinc convexiuscula, sub lente punctulatissima, marginibus integris, ore indiviso. *Filamenta* tria, antheris linearibus flavis. *Stylus* stigmatibus duobus.

That this *Carex* should have occasioned some difficulty is not to be wondered at, when *Linnaeus* himself seems to have forgotten his own original determination upon the matter. In Sir *Joseph Banks's* herbarium there is a *Carex* named *brizoides*, which answers entirely to the Linnean description; "*Spicâ compositâ* DISTICHA nudâ, *spiculis androgynis* OBLONGIS CONTIGUIS, *culmo nudo*," in the *Sp. Plant.* p. 1381; to the synonym of *Haller*; and to the figure of *Michelius*, t. 33. f. 17. there quoted.

In the Linnean herbarium, the plant I am now speaking of is named *brizoides* by *Linnaeus* himself, and it accords with the synonyms of *Ray* and *Morison* quoted in the *Sp. Pl.* under *brizoides*. Still, however, as the figure of *Michelius* is a more pointed authority than the verbal descriptions of the authors just mentioned, I cannot but think that the plant in Sir *Joseph's* herbarium is what was originally described and intended for *brizoides*: accordingly I shall beg leave to accept it as such, and name this anew. For, at all events, it cannot answer to the description of *Linnaeus*, for the spike

is never distich, the spiculæ are never oblong or contiguous. Hence has arisen frequent error: Mr. *Lightfoot*, amongst the rest, rejected the idea of this being *brizoides*, and called it *canescens*.

But the *C. canescens* of *Linnaeus* is similar in shape to *curta*; so much so, that the figure in *Loesel* is as applicable almost to the one as the other: but when they are brought together, the widest difference presents itself. The *curta* is smaller in all its parts; then the squamæ are silvery, and very tender: in the *canescens* they are membranaceous and hard, as in the rest of the genus, and are brown with a white edge, which gives it a real hoary appearance. We may gather from this circumstance, how necessary coloured figures are to mark the nicety of distinction requisite to ascertain some species in natural history. It is true, it makes the study very expensive; but it must be allowed, that unless very accurate descriptions accompany the uncoloured print, a difficulty of ascertainment may after all subsist.

The capsules, together with the squamæ of this species, are very early deciduous: I know not any *Carex* in which this impoverishment takes place so early, except in *C. stricta*. The whiteness and tenderness of the squamæ in this species are striking circumstances. These qualities are not to be found in any other. The root, though it cannot be called directly creeping, has a tendency to increase itself something in that way. The *brizoides* of Sir *Joseph Banks*'s herbarium has evidently a creeping root. As it is the only specimen that I have ever seen, I will beg leave to subjoin a description of it.

Radix repens, perennis. *Folia* pallidè virescentia, tenuia, culmo longiora, ad margines carinamque aspera, inferiora (uti sæpius accidit) breviora, & culmi basin obvestientia. *Culmus* triqueter, angulis acutis asperis, erectus, nudus. *Spica* androgyna—Spiculæ circiter septem, teretes s. oblongiusculæ, sub-distichæ, approximatae, sæpius

contiguæ. Flores inferiores masculi. *Squamæ* oblongæ, acutæ, pallidæ, nervo dorsali viridi, teneriusculæ, margine albo tenerrimo, capsulas sub-æquantes. *Capsulæ* oblongæ, acutæ, glabræ, marginibus ferrulatis, sub-triquetræ, hinc planæ, ore diviso. *Filamenta* tria—*Stylus* stigmatibus duobus.

As I take it for granted that *C. curta* is not the *brizoides* of Linnæus, and as the names of subsequent authors are not expressive of its distinction, I have restored *Loesel's* name, *curta*. Linnæus applies this figure of *Loesel* to his *canescens*, but, I have always thought, without sufficient authority; and I am happy in being countenanced in this idea, by our worthy President's remark in his edition of the *Flora Lapponica*. See n. 332.

The true *C. brizoides* is very properly described by *Schreber*, in his *Spicilegium Fl. Lips.* p. 63. n. 675.

6. CAREX OVALIS.

C. spiculis sub-fenis ovalibus approximatis alternis, squamis lanceolatis capsulam æquantibus. *Buddle, Hort. Sic.* p. 31. n. 2. *Pet. Hort. Sic.* vol. I. p. 163. n. 2.

Gramen cyperoides majus spicâ divulsâ. *Morif. Hist. Ox.* III. 244. f. 8. t. 12. f. 29.

Gramen cyperoides spicâ e pluribus spicis mollibus compositâ. *Scheuchzer*, 456. t. 10. 15.

C. leporina. *Fl. Angl.* p. 404. *Fl. Scot.* 547. *Pollich*, n. 874. cujus descriptio bona. *Leers*, 199. t. 14. f. 6. quoad formam scilicet, at non situm florum masc. & fœmin. *Withering*, 1029.

Habitat in palustribus & pratis humidis. Junio.

Radix fibrosa, perennis. *Folia* saturatè viridia, ad oras carinasque asperiuscula, angusta, culmum sub-æquantia. *Culmus* erectus, pedalis, tri-

triqueter, angulis acutis, asperiusculis. *Spica* androgyna composita, spiculis subsenis approximatis alternis sub-ovalibus. Ad basin spiculæ inferioris bractea basi ovata in setam spiculæ suæ longitudine definens, ad cæteras bractea oblonga est & aphylla. *Flores* inferiores masculi pauciores, cæteri plures fœminei. *Squamæ* ovato-lanceolatæ, acutæ, capfulam æquant, fuscæ, margine albo, nervo dorsali viridi. *Capsulæ* oblongæ acuminatæ, hinc planæ, illinc convexiusculæ, erectæ, ore integro. *Filamenta* ut in cæteris—*Stylus* stigmatibus duobus.

It has been lately discovered, that we have all along been mistaken in this very common plant. The error perhaps rests with *Linnaeus* himself, who joined the plant, he originally named *leporina*, with this we are now treating of. The mistake took place even so early as the publication of *Fl. lapponica*, as appears from his quoting *Morison's* figures. The original *leporina*, now preserved in Dr. *Smith's* (the Linnean) herbarium has only three spikelets, is a plant much smaller, and differs in many respects.

C. ovalis is distinguishable in all its stages from others by the number of the spiculæ, the acuteness of the squamæ, and the situation of the male and female flowers. In this the male flowers are at the base of the spikes, and few in number; the female ones numerous, and terminal.

Leers describes his *leporina* as having the terminal florets male, and the inferior female. Although therefore his figure is a very exact representation in other particulars, the situation of the male and female flowers must not be taken from his description.

7. CAREX REMOTA.

C. spiculis axillaribus solitariis remotis subsessilibus, foliolis longissimis, capsulis apice indivisis. *Buddle, Hort. Sic.* p. 31. n. 5.

Carex angustifolia, caule triquetro, capitulis pulchellis strigosioribus compactis, inter se distantibus, & in foliorum alis sessilibus. *Mich. Gen.* 70. t. 33. f. 15, 16.

Gramen cyperoides angustifolium spicis parvis sessilibus in foliorum alis. *Morif. Hist. Ox.* III. 243. f. 8. t. 12. f. 17. *Leers*, t. 15. f. 1. *Fl. Cantab.* n. 683. *Fl. Angl.* 407. *Withering*, 1035. *Pollich*, n. 878. *Fl. Scot.* 549. *Fl. Dan.* 370.

Habitat in sylvis humidis, & ad ripas udas fossarum. Maio, Junio.

Radix perennis, fibrosa. *Folia* radicalia angustissima compressa, marginibus omnino, at solum apicem versus carinâ aspera, culmo sub tempore inflorescentiæ longiora—*Caulina*, quæ & bractææ dicantur, ad basin spicularum sita (scilicet ad omnem spicam unicum sessile angustissimum) duo infima culmum fere semper cætera aliquando superant, carinâ marginibusque aspera. *Culmus* tenuis, debilis, erectus, triqueter, angulis acutis supernè asperis, infra bracteam inferiorem glabris. *Spica* composita androgyna, spiculis circiter 10, ovatis axillaribus solitariis remotis subsessilibus—Flores masculi inferiores. *Squamæ* ovatæ, acutæ, fuscescentes, membranaceæ, nervo dorsali viridi. *Capsule* ovatæ, acutæ, hinc planæ, illinc convexiusculæ, lateribus apicem versus ferrulatis, apice indiviso. *Filamenta* & *antheræ* ut in cæteris. *Stylus* stigmatibus duobus.

There is no difficulty in determining this species—There is only one in the whole family which has any affinity to it, viz. *C. axillaris*; but that is readily distinguished by having three or more spikelets at the base of each bracteaceous leaf.

8. CAREX

8. *CAREX AXILLARIS*. TAB. 19. fig. 1.

C. spiculis axillaribus, subternatis, remotis, sessilibus, foliolis longis, capsulis apice divisis.

Præcedentis (remotæ) insignis varietas, si non species distincta.

Buddle, Hort. Sic. p. 31. n. 6.

Habitat prope Putney—Dom. *Curtis*, inter rariores. Maio, Junio.

Radix perennis, fibrosa—*Folia* radicalia angusta, compressa, marginibus omnino, carinâ circiter dimidiam partem asperis, culmo etiam sub inflorescentiâ brevioribus: Caulina, quæ & bractææ dicantur, ad basin spicularum sita sunt, scilicet ad omnem spicularum aggregationem unicum, sessile, quorum infimum culmo longius, cætera breviora; omnia marginibus carinâque asperrima. *Culmus* erectus, firmus, strictus, triqueter, angulis acutis, etiam infra bracteam inferiorem asperrimis, 1—fere 3-pedalis. *Spica* androgyna interrupta, spiculis axillaribus, inferioribus sub-ternis, quandoque quaternis, quinis, ad basin foliorum caulinorum s. bractearum, oblongæ, sessiles, aggregatæ—Flores inferiores masculi—Squamæ ovatæ, acutæ, fuscescentes, membranaceæ, nervo dorsali viridi, capsulam sub-æquantes. *Capsulæ* ovatæ, acutæ, hinc planæ, illinc convexiusculæ, lateribus apicem versus ferrulatis, apice diviso. *Filamenta* ut in cæteris. *Stylus* stigmatibus duobus.

The great difference between this and *remota*, to which it seems most allied, is, that *axillaris* has a strong and rigid culm, *remota* a soft, thin, and weak one. *Axillaris* has its spiculæ in the base of the leaves by threes, sometimes by fives, particularly the lowermost.

The

The *remota* never has more than one spikelet at the base of each leaf. *Remota* has its capsules entire at the apex—*Axillaris* bifid.

Linnaeus, in his *Sp. Pl.* seems to have described *C. remota* twice over, under the names of *axillaris* and *remota*. Whether he had seen this species, or whether he described *remota* twice through mere inadvertence, I know not. No person, I believe, has noticed this species, except Mr. *Buddle*, who very properly questions the propriety of its being classed with *remota*.

I am indebted to my very intelligent friend Mr. *Curtis* for roots of this plant, who first found it near *Putney*.

9. CAREX INCURVA.

C. spicâ conicâ spiculis plurimis congestis sessilibus compositâ, involucro nullo, culmo incurvo. Lightfoot Flora Scot. p. 544. pl. 24. Fl. Dan. 432.

Carex juncifolia. Allioni Fl. Pedemont. 2296. t. 92. f. 4.

Having never had the good fortune of seeing this plant growing, and having only imperfect specimens of it, I must refer to Mr. *Lightfoot*'s description and figure. Mr. *Lightfoot*'s figure represents the plant in flower: in its feeding state it loses something of its conic form, and becomes obtuse. The capsules are somewhat oblong and acute, and a little longer than the squamæ, which are ovate, and somewhat acute.

When honoured with permission to consult her Majesty's herbarium, I saw Mr. *Lightfoot*'s original specimen. Fearful of doing any injury by handling it, I forbore taking a minute description of it. It ranks next to *C. arenaria*, from which it is sufficiently distinct, by its conic and compact spike.

10. CAREX

10. *CAREX ARENARIA*.

Spicâ foliosâ oblongâ acutiusculâ, spiculis plurimis; terminalibus masculis; inferioribus foemineis, culmo incurvo. *Buddle, Hort.*

Sic. p. 31. n. 7. *Mich. Gen.* p. 67. n. 1 & 2. f. 3. quoad figuram spicæ, & f. 4.

Carex arenaria. *Leers,* t. 14. f. 2. *Fl. Suec.* n. 835. *Fl. Angl.* p. 404. *Fl. Scot.* 545. *Withering,* 1029.

Habitat in arenosis maritimis. Junio.

Radix valde repens, crassa, ramis divaricatis. *Folia* angusta, nigro-viridia, ad margines carinamque asperiuscula, variantia culmo breviora, longiora. *Culmus* incurvus, 4-12 uncialis, triqueter, angulis acutis scabriusculis. *Spica* composita spiculis circiter 7-16 oblongis, androgynis, sursum imbricatis, infernè remotiusculis, bracteatis, bracteis foliaceis, inferioribus brevibus, in folium tenuissimum desinentibus; superioribus ovatis membranaceis sub-aphyllis. In omni fere spiculâ flores terminales masculi—Spiculæ inferiores sub-foemineæ, superiores sub-masculæ. Squamæ ovatæ, acutæ, (longo sæpiùs acumine), capsulas maturas æquantes. *Capsulæ* ovatæ, acuminatæ, hinc planæ fulcatæ, illinc carinatæ, apicem versus utrinque alatæ f. margine membranaceo, ore bifido. *Filamenta & antheræ* ut in cæteris. *Stylus* stigmatibus duobus.

Mr. *Lightfoot*'s description of this plant is very well drawn: but I have spoken sufficiently of it under *C. intermedia*. It is not usually found but in the vicinity of the sea-shore, and there, for the most part, in loose sand. I have been told that it has been found in the inland parts of Germany, in sand, which evidently appears to be the same as what we call sea-sand, and, perhaps, before the diluvian wreck of the world, had its place on the sea-side.

I have often brought roots of it into my garden, but they would never flourish handsomely. They exist indeed, but scarcely ever produce flowers, and shew every token of distaste and disaffection.

I have scarcely a doubt but that *Michelius* was deceived in the specimens sent him, and drew his figure t. 33. f. 3. (which is quoted under *C. disticha* of Mr. *Hudson*) from an old dried specimen of *C. arenaria*, as any one may judge who will compare the specimens of that plant, which he will find withering in the months of August and September. Had the culm been represented incurved, I could have had no doubt. *Michelius* received his specimens from London and Paris.

II. CAREX INTERMEDIA.

C. Spicâ oblongâ obtusâ, spiculis plurimis; infimis terminalique foemineis; intermediis masculis, culmo erecto. Buddle, Hort. Sic. p. 31. n. 4.

C. arenaria, Leers, t. 14. f. 2.

C. disticha, Fl. Angl. p. 403. Fl. Scot. 546. Withering, 1028.

C. spicata, Pollich, n. 875.

Habitat in palustribus. Junio.

Radix valdè repens, crassiuscula, perennis—*Folia* saturatè viridia, erecta, ad margines carinamque asperiuscula, culmo sæpe breviora. *Culmus* erectus, firmiusculus, triqueter, angulis acutis asperis, pedalis & ultra, nudus. *Spica* androgyna, composita, spiculis 8-20 approximatis, sursum imbricatis, ovatis, circiter tribus infimis & terminali sub-foemineis, cæteris sub-masculis—in foemineis scilicet sæpiùs flos unus aut alter masculus, & in masculis foemineus conspicendus est. *Flores* foeminei semper inferiores. Ad spicam inferiorem

riorem bractea basi ovata, supernè in foliolum setaceum longiusculum definens—ad cæteras, bractea ovata sub-aphylla. Squamæ fuscae, ovatae, acutæ, capsulas æquantes, nervo carinali concolore. Capsula oblonga, acuminata, ore diviso, hinc plana, illinc convexiuscula lateribus (oculo bene armato), membranâ sub-lacerâ s. ferrulatâ marginatis. Filamenta & antheræ ut in cæteris. Stylus stigmatibus duobus.

The name *disticha* (which by no means corresponds with its growth) being applied to this plant, has occasioned its being not well known: *Pollich* revolts at the idea, and calls it *spicata*. Mr. *Lyons* observes, that the spike is *vix disticha*. As the leading character in this *Carex* is its having generally the intermediate spiculæ almost entirely male, I have ventured to apply a name which has immediate respect to this uncommon circumstance.

The *C. intermedia* and *arenaria* approach so nearly to each other, that I scarcely know what to make of the descriptions which some authors have given of them—I apprehend that they have trusted too much to their place of growth: no dependance can be placed on that matter. Although *C. intermedia* does not grow in sand, yet it is by no means unusual to find *arenaria* in meadows by the sea-side. Mr. *Lightfoot* had not a correct notion of *intermedia* (his *disticha*), for he says it differs from *C. arenaria* by *not* having a creeping root, whereas in fact no *Carex* is more strongly endowed with this injurious quality. *Pollich*'s description is not accurate, for he takes no notice of the female terminal spikelet. *Leers*, always accurate, rightly attends to this prominent feature: no one can mistake his figure.

Some of the spiculæ in this species, and in *arenaria*, being purely male, and others female, would almost justify the classing of them amongst those *sexu distinctas*—but it is not constant enough to war-

rant such a step as that; besides, the habit is altogether that of the androgynous ones. For although *Leers* says he found the intermediate spikelets purely male, yet in almost all of them two or three female flowers are to be seen at the base; and thus in the female spiculæ, male flowers from 1—3 at the summit. A few spiculæ are truly androgynous.

After all it must be allowed, that *intermedia* and *arenaria* are very nearly allied. Notwithstanding the obscurity thrown over these plants by the confusion arising from wrong synonyms and imperfect descriptions, yet there is character enough peculiar to each. In *intermedia*, the root creeps deeply under ground, and in a very irregular manner. In *arenaria*, it creeps just below the surface, and while the main shoot runs in a straight line, side-shoots strike off at right angles; it makes a beautiful appearance by this means, forming, with the shoots it sends up, *parterres*, &c. which become at once its ornament and distinction. In *intermedia* the culm is erect, in *arenaria* incurved. In *intermedia*, the spike (the terminal spicula being feminine) is obtuse: in *arenaria* (many of the terminal spiculæ being almost entirely male) it is acute. In *intermedia*, the capsule has its margin entire; in *arenaria*, it is marginated on each side towards the apex with a broadish membrane.

I have never met with the variety β of Mr. *Hudson*. I have observed indeed, occasionally, some of the spikes with very few spiculæ; but I never found any plant throwing up all its culms in general with so few spiculæ as are represented in *Plukenet's* figure. Dr. *Withering* supposes this figure to be a representation of Mr. *Hudson's* *C. brizoides*.

Leyser can scarcely be supposed to know Mr. *Hudson's* *C. disticha*; for he says, *Nulla laudabilis figura hujus Caricis quantum novi extat, Morif. Hist. 3. f. 8. t. 12. f. 32. illi quodammodo similis. See Leyser's Fl. Hal. C. disticha.*

But

But *Leers*'s figure is most excellent, which work he quotes. See *Carex acuta*, *Fl. Hal.* n. 959.

12. *CAREX DIVISA*. TAB. 19. fig. 2.

Spicâ ovatâ sub-decompositâ foliolo erecto instructâ, spiculis sub-confertis, capsulis adpressis, radice repenti. *Buddle's Hort. Sic* p. 31. n. 3. *Fl. Angl.* p. 405.—*Withering.* p. 1033.

Habitat in palustribus maritimis. Maio, Junio.

Radix valdè repens, crassa, perennis. *Folia* saturatè viridia, erecta, ad margines carinasque asperiuscula, culmo longiora, angusta, apicem versus tenuissima. *Culmus* erectus, debilis, pedalis & ultra, ad spicam foliosus foliolo sæpiùs longissimo (variat autem & brevi, immò brevissimo) tenui, erecto, triqueter angulis acutissimis (variat etiam obtusiusculis) asperiusculis. *Spica* composita est ubi nec rarò decomposita, quippe ad basin spicæ divisio fit, unde decompositio oritur. Scilicet ramulus brevissimus, si fas sit hoc nomine appellare, spiculas quasdam ovatas confertas gerit. Sub omni spiculâ bractea fusca, oblonga, inferius lata, apice in setam brevem desinens, subtenditur. Spiculæ ovatæ, sub-contiguæ, erectæ, floribus terminalibus masculis. Squamæ fuscæ, ovatæ, acutissimæ, capsulâ longiores. *Capsulæ* ovatæ, acutæ, hinc sub-cavæ, illinc gibbæ, arctè imbricatæ, rachi appressæ, nec minimè patentés, apicem versus sub-membranaceo-marginatæ. *Filamenta* ut in cæteris—*Stylus* stigmatibus duobus; & iisdem, sæpiùs præ maritos tardos expectando, longioribus.

I have not ventured to adduce any synonyms from *Lobel*, *Gerard*, or *Parkinson*. The similarity between this and *muricata* is in some stages of growth and situations too close to be kept apart by such rude figures.

This.

This plant varies very much—sometimes the culm is triquetrous with very sharp angles, sometimes it is rather blunt; sometimes the erect floral leaf is extremely short, sometimes it is extended to a great length: but the root is always very thick and creeping; the leaves very narrow and erect; the culm very thin, and has the habit of a *Scirpus*.—The spike has its spikelets sub-contiguous, often crowded; and the capsules are closely imbricated, and rather turning inward, not at all spreading or opening.

The male flowers, which in this species terminate the spikelets, appear very late, which often occasions a considerable elongation of the styles waiting for their impregnation. Perhaps this circumstance might be urged as a collateral proof of the truth of the sexual system.

13. CAREX MURICATA.

Spicâ oblongâ sub-decompositâ, spiculis distinctis, capsulis divergentibus ore fisso, radice fibrosâ. *Buddle, Hort. Sic. p. 32. n. 3.*
Petiver. Hort. Sic. vol. 1. p. 166. n. 4.

Gramen sylvaticum tenuifolium rigidiusculum. *Morif. Hist. Ox. III. f. 8. t. 12. f. 27.*

Gramen cyperoides minus spicis minoribus minusque compactis. *Scheuchzer, 488. t. II. f. 5.*

Carex nemorosa, fibrosâ radice, angustifolia, minimâ caule exquisitè triangulari, spicâ brevi interruptâ. *Michel. p. 69. t. 33. f. R, and fig. 14. Fl. Suecica, n. 839.*

C. spicata. *Flo. Angl. 405. Withering 1032. Flora Scot. 548.*

Habitat in fylvis & pratis humidis. Maio, Junio.

Radix fibrosa, perennis. Folia amœnè viridia, angusta, ad oras carinasque aspera, culmo longiora. Culmus erectus, pedalis & ultra, triqueter,

triqueter, angulis acutis asperis. *Spica* androgyna, composita, sæpe decomposita: spiculæ circiter decem, infernè remotæ, supernè contiguæ, ovatæ, sessiles, apice masculæ, bracteatae bractea basi sub-ovatâ, supernè in foliolum setaceum hispidum definienti—hæc bractea ad inferiores spiculam suam longè superat—Squamæ ovatæ, acutæ, capsulâ breviores, fuscæ, margine membranaceo albo, nervo dorsali viridi. *Capsulæ* ovatæ, acutæ, hinc planæ, illinc convexæ, glabræ, ad margines supernè hispidiusculæ, sub-divergentes, ore bifido. *Filamenta* ut in plerisque. *Stylus* stigmatibus duobus.

The Linnean herbarium countenances my differing from the authors of our country in the naming of this plant *C. muricata*; for it stands there so inscribed by *Linnaeus* himself. Indeed the little plant which is usually called *muricata*, by no means justifies the accuracy of appellation for which *Linnaeus* was so remarkable. On the contrary, this plant fully corresponds with the appearance which might be expected from that name.

I am very fully persuaded that *Linnaeus*, and after him the Swedish botanists, confounded the two plants. This appears pretty evident from the figures quoted by *Linnaeus*; and it is but fair to imagine that they thought it varied from soil and situation. *Haller*, in his history, n. 1366, says he received Mr. *Hudson's* *muricata* from *Sweden* under the name *muricata*. This circumstance, and *Linnaeus's* naming this plant of which I am now speaking *muricata* also, confirm me in my idea.

C. muricata differs from *vulpina*, by never having its spike supra-decomposite, nor the culm enlarged beneath the spike. It differs from *C. divisa* of Mr. *Hudson*, by its fibrous root, and by having its capsules diverging, and no erect leaf under the spike. It differs from *stellulata*, by its numerous and contiguous spiculæ, and its capsules divided at the summit.

Var.

Var. β . There is a variety rather slenderer in its form, with its spike rarely decompound—The culm is not so rough on its angles, and towards the base it is roundish, insomuch that many have taken it for *divisa* of *Huds.* inclined so to do by his specific description, and by *Parkinson's* synonym. *Michelius*, t. 33. f. 12, and *Scheuchzer*, t. 11. f. 5. are rather representations of this variety. A plant of it is preserved in vol. 12. of *Uvedale's Herb. Rayanum*, p. 72. n. 2.

14. CAREX DIVULSA.

Spicâ decompositâ elongatâ basi sub-ramosâ, spiculis inferioribus remotis; summis contiguis, capsulis sub-erectis. *Buddle, Hort. Sic.* p. 32. n. 4. *Pet. Hort. Sic.* p. 166. n. 2. and p. 167. n. 1.

Carex nemorosa, fibrosâ radice, caule exquisitè triangulari, spicâ longâ divulsâ seu interruptâ, capitulis solitariis, præterquam ultimo. *Mich. Gen.* 69. t. 33. f. 10. *Withering*, 1035.

C. canescens, *Fl. Ang.* 405.

Habitat in nemorosis humidis. Maio, Junio, Julio.

Radix perennis, fibrosa. *Folia* saturatè viridia, subangusta, carinâ marginibusque asperis, culmo longiora. *Culmus* pedalis, sesquipedalis, debilis, sub-reclinatus, triqueter, angulis acutis asperiusculis. *Spica* interrupta, elongata, basi sub-ramosa, androgyna—*Spiculæ* inferiores remotæ, plurimæ, ovatæ, sessiles, bracteis setaceis hispidis; superiores contiguæ floribus masculis terminalibus. *Squamæ* membranaceæ, albæ, ovatæ, mucronatæ, nervo dorsali viridi qui in mucronem exit, capsulis longiores. *Capsula* ovata, acuta, hinc plana, illinc convexiuscula, erectiuscula, ore bifido. *Stamina* tria. *Stylus* brevis, stigmatibus duobus.

The figure of *Michellius* is too accurately drawn to admit of any doubt in the application of it: neither would this plant have ever come into dispute, had not *Loesel's* figure t. 32, been adduced to represent it. How that mistake arose I know not—It seems to have originated with Mr. *Ray** himself. See *Ray Syn.* p. 424. *Loesel's* figure aptly enough represents *Linnaeus's* *C. canescens* and *Hudson's* *brizoides*, particularly the latter, for the outline of both is nearly the same: but it has nothing to do with *C. divulsa*.

Carex divulsa has a weakish reclining culm, a long interrupted spike, with one or two branches at the base; the spikelets are remote; and the capsules, though standing loose and a little spreading, yet are not diverging. This last circumstance is worth attending to, as it keeps it distinct from thin starved specimens of *Carex vulpina*, as figured by *Leers*, t. 14. f. 3.

15. CAREX VULPINA.

C. spicâ supra-decompositâ coarctato-ramosâ obtusâ, spiculis supernè masculis, capsulis divergentibus, culmi angulis acutissimis. Buddle Hort. Sic. p. 32. n. 1.

Carex palustris major, radice fibrosâ, caule exquisitè triangulari, spicâ brevi habitiori compactâ. Mich. Gen. 69. t. 33. f. 13.

Gramen cyperoides palustre majus. Park. 1266. Moris. Hist. Oxon. III. 244. f. 8. t. 12. f. 24.

Leers, t. 14. f. 5. With. 1030, where see an account of the several varieties of this species. Fl. Dan. t. 308. Pollich. n. 876. Fl. Suecica, n. 838. Fl. Angl. p. 404.

* Mr. *Ray* was in general so very accurate that it may be questioned whether later writers have not mistaken him: *Loesel's* figure is so plain and characteristic, that it may be doubted whether *Ray's* synonym does not actually relate to *Loesel*, that is, to our *C. curta*.

Habitat passim in palustribus, & ad ripas fossarum & fluviorum.
Maio.

Radix fibrosa, perennis. *Folia* saturatè viridia, latiuscula, ad oras carinasque aspera, culmum superantia. *Culmus* erectus, firmus, rachi spicæ multo auctior, pedalis, bipedalis, triqueter, lateribus sub-excavatis, & inde angulis acutissimis, asperis. *Spica* androgyna, supradecomposita, coarctato-ramosa, oblonga, obtusa, ramis distantibus rigidis. Ad basin omnis rami, bractea basi ovata, supernè in foliolum setaceum hispidum desinens—Spiculæ sessiles, ovato-rotundæ, supernè masculæ—Squamæ ovatæ, acuminatæ, fuscæ, membranaceæ, nervo dorsali viridi, capsulis paulò longiores. *Capsulæ* oblongæ, acuminatæ, hinc planæ, illinc convexiusculæ, divergentes, ore bifido. *Filamenta* tria, antheris linearibus flavis. *Stylus* stigmatibus duobus.

Of this well-known species no doubt can be entertained.—The stoutness of its culm, the closeness and rigid nature of the spike, and its supradecomposition, mark it very strongly. Dr. *Withering* notes several varieties, but they all fall under the general description which I have given above. To distinguish it still more nicely from some of its affinities, observe—I. That the spike is furnished with many bractæ ending in a setaceous leaf, and that the culm is most sharply triangular, and the sides are hollowed, or sink in.—Then the capsules are divaricated. Moreover, the culm is enlarged below the spike, and seems suddenly contracted when it meets the rachis of the spike. Hence it seems to be very different from *muricata*, to which it is most nearly allied; and also from *teretiusecula*, which has its culm somewhat roundish.

Leers fig. t. 14. f. 3. is a variety of this plant, and not *Carex divulsa*, as is evident from the diverging of the capsules.

16. CAREX TEREIUSCULA. TAB. 19. fig. 3.

Spicâ supra-decompositâ coarctato-ramosâ acutiusculâ, spiculis glomeratis supernè masculis, capsulis patentibus, culmo tereiusculo.

Habitat in palustribus propè Norwich. Dom. Crowe. Maio.

Radix fibrosa, perennis. *Folia* viridia, erecta, rigidiuscula, culmi ferè dimidium vaginantia, vaginâ superâ hinc membranaceâ transversim rugosâ, basi extus convexa, intus canaliculata, supernè carinata ut in cæteris accidit, oris carinâque aspera, culmo florifero longiora—Folium superum cæteris longius evadit.—*Culmus* florifer foliis $\frac{1}{2}$ brevior, triqueter angulis acutis asperis, inter angulos autem quasi torus longitudinalis prominulus, adeò ut culmus tereiusculus visus est. Culmus tandem pedalis, sesquipedalis evadit.—*Spica* androgyna, terminalis, ovato-oblonga, acutiuscula, supra-decomposita, bractea infimâ brevissimâ, basi dilatatâ, utrinque membranaceâ fuscâ, margine ipso albo, in setam desinenti spiculâ suâ breviori. Spiculæ & spiculellæ ovatæ, acutæ, sessiles—Flores masculi superiores, plures; fœminei inferiores, circiter sex—Squamæ fuscæ margine albo membranaceæ, nervo dorsali viridi abbreviato, ovatæ, acutæ.—*Capsulæ* ovatæ, acutæ, hinc planiusculæ, illinc convexæ, gibbæ, marginibus ferrato-hispidis, patentes—Maturæ squamâ subtensâ $\frac{1}{2}$ longiores. *Filamenta* tria, antheris linearibus flavis. *Stigmata* duo.

I understand that Mr. Crowe of Norwich is the discoverer of this plant. It comes very near *C. paniculata*, but it is nearly twice as small in all its parts.

As far as cultivating it three years will enable me to speak, I will beg leave to state a difference. Its spike is never in the least panicked, but always close: its seeds are remarkably gibbous on one side, which is not observable in *paniculata*: its culm is not triangular, like that of *paniculata*, but, owing to a prominent line running down the planes of the sides, roundish—not but that it always retains somewhat of a triangular form, with its angles rough. Its leaves are erect, and usually incurved—*Paniculata* has them always spreading. It differs in œconomy also, not forming those large tufts of grass for which *paniculata* is so remarkable.

It has no affinity to *vulpina*, for its capsules are never diverging, nor its culm enlarged beneath the rachis of the spike.

As the round appearance of the culm is an obvious mark of distinction, I rest the specific difference principally upon that circumstance. The gibbosity of the capsule also is very constant.

Mr. *Curtis* favoured me with roots of this plant.

17. CAREX PANICULATA.

C. spicâ supra-decompositâ paniculato-ramosâ acutâ; ramis alternis remotiusculis, capsulis patentibus, culmo triquetro. Buddle Hort. Sic. p. 31. n. 1. Pet. Hort. Sic. Vol. I. p. 163. n. 1. both varieties?

Cyperus alpinus longus inodorus, paniculâ ferrugineâ minus sparsâ. Scheuchzer 499. prod. t. 8.

Carex radice repenti caule exquisitè triangulari spicâ multiplici ferrugineâ & fuscâ. Mich. Gen. 68. t. 33. f. 7.

Gramen cyperoides palustre elatius spicâ longiore laxâ. Moris. Hist. Oxon. III. 244. f. 8. t. 12. f. 23. Sp. Plant. p. 1383. Leers, t. 14. f. 4. Pollich. n. 882. Fl. Angl. 403. Withering 1036.

Habi-

Habitat in palustribus putridis & aquosis. Junio.

Virginia Water.

Radix fibrosa, perennis. *Folia* viridia, ad oras carinaeque valdè aspera, culmo longiora, sub-angusta, canaliculata, exteriora breviora. *Culmus* pedalis, 2-pedalis & ultra, internè foliis obsitus, erectus, strictus, triqueter, angulis acutioribus asperis. *Spica* supra-decomposita, paniculato-ramosa, androgyna. Ad basin cujusque ramuli, bractea ovata in mucronem elongatum nonnunquam in setam desinens, fulva, membranacea, margine albo. Ad omnem etiam spiculam unica ejusdem formæ. Spiculæ inferæ remotæ, superæ congestæ, ovatæ, omnes sessiles, floribus inferioribus, circiter quatuor foemineis, superioribus pluribus masculis—Squamæ ovatæ, concavæ, acutæ, membranaceæ, fuscæ, margine albæ, carinatæ, carinâ ciliato-hispidâ, nervo dorsali viridi, capsularum fere longitudine. *Capsulae* ovatæ, acutæ, laxæ, patentes, hinc planæ, illinc convexæ, ad margines ferrulatæ, acuminatæ, ore bifido. *Filamenta* tria, antheris linearibus flavis. *Stylus* brevis, stigmatibus duobus.

The lax branchy disposition of the spike is a sufficient mark of discrimination in this species. As the term *racemus compositus*, though scientifically exact, and applicable to this species, seldom occurs in the Linnean description, I have changed it for one of a more general and popular nature, *spica paniculato-ramosa*.

The branches are alternate, and somewhat distant from each other.—The capsules in this species are sometimes somewhat diverging, and of the same length as the squama which guards them.—The whole spike is triquetrous, oblong, and acute at its first opening.

This *Carex* is admirably well qualified for planting in loose boggy

boggy ground; its immense tufts forming firm support for the heaviest bodies.

The Var. β of *Withering*, upon being cultivated in a rich wet soil, formed its spike as branching as Var. α .

18. CAREX DIGITATA.

C. bracteis membranaceis sub-aphyllis vaginantibus dimidiatis, spicis linearibus erectis: masculâ breviori, capsulis distantibus.

Gramen caryophyllatum polycarpon fructu triangulo. *Loef. Prus.* p. 112. t. 27.

Gramen caryophyllatum montanum spicâ varia. *Bauhin. Prodr.* p. 9. *Scheuchzer*, p. 448. t. 10. f. 14.

Cyperoides montanum nemorosum, caule triquetro, compresso, spicis ferrugineis tenuioribus inter se distantibus; capsulis rarius dispositis, oblongis, turbinatis, trilateris. *Mich. Gen.* 65. t. 32. f. 9. *Leers*, t. 16. f. 4. *Fl. Angl.* p. 409. *Pollich.* n. 884. *Fl. Suecica*, n. 844. *Withering*, 1041.

Habitat in sylvis & umbrosis propè Bath. *D. Sole.*

Radix fibrosa, perennis; partes quæ radici proximæ, seu culmi sive folia sint, omnes rubræ. *Folia* nigro-viridia, culmo inflorescenti longiora, marginibus ad basin retrorsum hispidis, ad medium lævibus, apicem versus antrorsum hispidis, carinâ lævissimâ. *Culmus* 6—12 uncialis erectiusculus, obsolete triqueter, angulis obsoletis, basi squamis striatis vaginantibus in foliolum acutum brevissimum desinentibus obvestitus. *Spicæ* sexu distinctæ, terminalis mascula, tres aliquando duæ subjectæ foemineæ, omnes lineares—Spica mascula tenuis, squamis rubro-ferrugineis, oblongo-ovatis, obtusis, nervo dorsali viridi. *Spicæ* foemineæ etiam tenues, circiter 7-floræ, pedunculatæ,

dunculatæ, bractea membranaceâ sub-aphyllâ (rariùs scilicet in foliolum brevissimum acutum definit) dimidium pedunculi cujusque amplectenti; superior ad basin spicæ masculæ sita est, & eandem altitudine superat—cæteræ inferiores remotiusculæ. Flores laxè imbricati, alterni, distantes—Squamæ ut in masculâ capsulam æquantes. *Capsulæ* obovatæ, trigonæ, acutæ, pubescentes, apice indiviso. *Filamenta* tria—*Stigmata* tria.

19. CAREX CLANDESTINA.

C. bracteis membranaceis sub-aphyllis vaginantibus, spicis fœmineis remotis vaginam vix exsuperantibus.

Cyperoides montanum humile angustifolium, culmo veluti folioso spicis obseffo. *Scheuchzer*, 407. t. 10. f. 1. *Mich. Gen.* 63. t. 32. f. 8. ex auctoritate cel. *Schreberi*, *Spic. fl. lips.* p. 65. n. 1013.

Carex echinata *Mun. prodr. Ritz. prodr. Scand. ed. 2.*

Habitat in rupe Sancti Vincentii dictâ, propè Bristol. *D. Sole.*

Radix perennis, fibrosa. *Folia* tenuia, culmo triplo & ultra longiora, canaliculata, marginibus carinâque apicem versus aspera. *Culmus* brevis, erectus, teretiusculus, hinc planiusculus, glaber. *Spicæ* sexu distinctæ, una mascula, tres fœmineæ, omnes remotæ. *Spica mascula* terminalis, oblonga, acuta, femuncialis, squamis fusco-ferrugineis, ovato-oblongis, obtusis, margine lato, membranaceo, albo, nervo dorsali viridi. *Spicæ fœmineæ* oblongiusculæ, paucifloræ, pedunculatæ—Ad unamquamque spicam bractea membranacea, sæpius aphylla, quæ non modo pedunculum, verum etiam spicam ipsam, sæpius sinu fovet. Hæc bractea nonnunquam in foliolum brevissimum exit.—Squamæ ut in masculâ, capsulam subæquantes. *Capsula* ovata, trigona, acutiuscula, ore indiviso. *Filamenta* ut in cæteris. *Stylus* stigmatibus tribus, longis.

If the very singular mode of growth in the *C. digitata* and *clandestina* did not strike the eye of the most incurious, the membranaceous vagina would be a sufficient distinction. In this species the spikes are pedunculated, but still, in their flowering state, rarely exceed the length of the vagina. This circumstance, and the flowering culms themselves being hidden among the leaves, induced me to call it *clandestina*. It flowers very early in the Spring, in the very beginning of April. He who cultivates it would do well to shelter it at that season from frost and wet, which often prevent it from ripening its seeds, or indeed opening its flower. It thrives in the garden, almost equally well in the common border, or in a watery situation. But all *Carices* certainly prefer moisture.

This plant, as I am informed, has been spoken of by *Dick* and other pupils of *Haller* under the name of *argentea*, and by *Allioni* under the name of *prostrata*. It is the *humilis* of *Leyser* and of *Schreber*.

The leaves, which overshadow the culms at their first appearance, are those of the preceding year, which usually continue green till their successors are enabled to take their place, and continue the system of protection.

20. CAREX PENDULA.

C. vaginis longis subæquantibus, spicis cylindricis longissimis pendulis, capsulis confertissimis ovatis acutis. *Buddle, Hort. Sic. p. 28. n. 2. Uvedale, Herb. Ray, vol. 12. p. 65. A & B.*

Gramen cyperoides spicâ pendulâ longiore. *Morif. Hist. Ox. III. 242. f. 8. t. 12. f. 4. Fl. Angl. 411. Withering, 1046. Fl. Scot. 564. Curtis Fl. Londinensis.*

Habitat in sylvis, & sepibus frequentius. *Maio, Junio.*

Radix

Radix fibrosa, perennis. *Folia* lata, crassa, rigida, nigro-viridia; subtus glaucescentia; ad margines carinasque asperrima, culmo breviora. *Culmus* 2—6 pedalis, erectus, firmus, triqueter, angulis internè acutis, supernè obtusiusculis, omnino glabris, nisi ad summum ubi internodium unum aut alterum asperiusculum est. *Spicæ* una mascula, circiter sex fœmineæ. Spica mascula triquetra, angulis acutis, sub-clavata, 2—4 uncialis, terminalis, squamis oblongis, acutis, fuscis, membranaceis, nervo dorsali viridi. *Spicæ* fœmineæ cylindricæ, pedunculatæ, 4—6 unciales, pendulæ, bracteis longè breviores, remotæ, floribus inferioribus remotis, superioribus arctiùs imbricatis. Squamæ membranaceæ, nigræ, oblongæ, acutæ, nervo dorsali viridi lato. Ad basin omnis pedunculi bractea, f. folium vaginans longum, vagina plerumque pedunculi longitudine. *Capsula* ovata, triquetra, glabra, acuta, ore indiviso, squamâ suâ longior. *Filamenta* tria. *Stylus* stigmatibus tribus.

The great size of this Carex, and its very long pendulous cylindrical spikes, enable the botanist to discriminate it at a great distance—It has remarkably small capsules for its size.

21. CAREX STRIGOSA. TAB. 20, fig. 4.

C. vaginis longis subæquantibus, spicis filiformibus laxis pendulis, capsulis oblongis sub-triquetris acutis.

Uvedale, Herb. Rayn. vol. 12. p. 64. n. 2. *Fl. Angl.* 411.
Withering, 1047.

Habitat in sylvis & sepibus—In sylvâ Witham dictâ, propè Oxoniam.

Dr. Sbeffield. Aprili, Maio.

Radix fibrosa, perennis. *Folia* lætè viridia, lata, marginibus carinæque asperis. *Culmus* erectus, 2-pedalis & ultra, triqueter, angulis acutis glabris, foliis longior. *Spicæ* unica mascula, circiter sep-

tem foemineæ. Spica mascula terminalis, linearis, teretiufculus, biuncialis, recta. Squamæ pallidè virentes, ovato-oblongæ, acutæ, margine membranaceo, albo, nervo dorsali lato, viridi. Spicæ foemineæ circiter septem, omnes filiformes, teretes, remotæ, primò erectæ, mox pendulæ, pedunculatæ, floribus laxè imbricatis; superiores sæpiùs floribus aliquot masculis terminalibus. Squamæ ut in masculâ. Ad basin omnis pedunculi bractea, f. folium vaginans, fatis longum, vaginâ pedunculi longitudine. Capsula oblonga, triquetra, acuta, ore indiviso, squamâ demum fere duplo longior. Filamenta tria, antheris linearibus, pallidè flavis. Stylus stigmatibus tribus.

In *Ray's Synopsis*, p. 419. n. 11. there is a short, but very expressive description of this plant. In noting however the affinity between this and *C. sylvatica*, it is alledged that this has either none or very short footstalks; and other authors have copied this error—It has in fact long footstalks, but they are concealed within the vagina—This concealment led the old botanists to describe it as having none.

It differs from *sylvatica* by its having its peduncles scarcely longer than the vagina, and by its capsules being three-cornered and acute, but not with a long taper rostrum.

My friend Dr. *John Sibthorp*, the learned *Regius* Professor of Botany in the university of *Oxford*, has lately discovered this plant in another situation in the neighbourhood of *Oxford*.

22. CAREX PRÆCOX.

C. vaginis brevibus subæquantibus, spicis approximatis; masculâ subclavatâ; foemineis ovatis, capsulis subrotundis pubescentibus.

Buddle, Hort. Sic. p. 30. n. 6 & 8. Uvedale, Herb. Rayan. vol. 12. p. 63. n. 3.

Gramen

Gramen cyperoides spicatum, Gerard. em. p. 22.

Gramen spicatum foliis caryophylleis. Park. 1160. Jacquin Fl. Austriac 446. Withering, 1043.

Carex montana, Fl. Angl. 407. Fl. Scot. 551.

Habitat in pratis & ericetis. Aprili, Maio.

Radix repens, perennis. *Folia* saturatè viridia, tenuia, ad margines carinamque aspera, culmo breviora. *Culmus* erectus, 6—12 uncialis, triqueter, angulis obtusiusculis glabris. *Spicæ* una mascula, tres foemineæ, approximatae propè summitatem culmi. Spica mascula femuncialis & ultra, oblonga, sæpius sub-clavata, triquetra, erecta, squamis membranaceis, sub-ferrugineis, oblongis, acutis, nervo dorsali viridi. *Spicæ* foemineæ ad basin masculæ, ovatae, breviter pedunculatae, erectae, floribus densiusculè imbricatis; squamis ovatis, acutis, capsulas subæquantibus. Ad basin pedunculorum, præsertim inferioris, bractea, s. foliolum vaginans, breve, vaginâ brevi, pedunculum brevem æquanti. Hoc foliolum nunquam aut rarissimè culmum superat. *Capsula* ovata, sub-triquetra, acutiuscula, ore indiviso, tomentosa, mox nigricans. *Filamenta* ut in cæteris. *Stylus* stigmatibus tribus.

This plant is very easy to be distinguished from the *pilulifera* and *saxatilis* of Mr. Hudson, by its having its spikes shortly pedunculated, and its peduncles encompassed by a vagina or sheath equaling them in length. *Pilulifera* and *saxatilis* of Mr. Hudson have no vaginæ. If the vagina be attended to, it will soon be discovered that no one of the British species bears any resemblance to this. *C. præcox* has a creeping root and an erect stalk, with angles somewhat sharpish. It is a very common plant, growing on most of our heaths and in meadows.

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Habitat in pratis & ericetis. Aprili, Maio.

Radix repens, perennis. *Folia* saturatè viridia, tenuia, ad margines carinamque aspera, culmo breviora. *Culmus* erectus, 6—12 uncialis, triqueter, angulis obtusiusculis glabris. *Spicæ* una mascula, tres foemineæ, approximatae propè summitem culmi. Spica mascula femuncialis & ultra, oblonga, sæpius sub-clavata, triquetra, erecta, squamis membranaceis, sub-ferrugineis, oblongis, acutis, nervo dorsali viridi. *Spicæ* foemineæ ad basin masculæ, ovatae, breviter pedunculatae, erectæ, floribus densiusculè imbricatis; squamis ovatis, acutis, capsulas subæquantibus. Ad basin pedunculorum, præsertim inferioris, bractea, s. foliolum vaginans, breve, vaginâ brevi, pedunculum brevem æquanti. Hoc foliolum nunquam aut rarissimè culmum superat. *Capsula* ovata, sub-triquetra, acutiuscula, ore indiviso, tomentosa, mox nigricans. *Filamenta* ut in cæteris. *Stylus* stigmatibus tribus.

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23. CAREX FILIFORMIS. TAB. 20. fig. 5.

C. vaginis brevibus subæquantibus, spicis masculis sub-duabus linearibus; foemineis ovatis remotis, capsulis hirtis.

Cyperoides sylvaticum angustifolium, spicis parvis tenuibus spadiceo-viridibus. *Scheuchzer*, 425. t. 10. f. 11. *Fl. Suecica*, n. 847.

Carex tomentosa, *Fl. Scot.* p. 553.

Habitat propè *Eaton*, in com. *Salop.* Rev. *E. Williams*.

At the south end of *Air Links*. Dr. *Hope*. Junio.

Radix repens, perennis. *Folia* tenuiora, erecta, in apicem tenuissimum desinentia, marginibus carinâque asperiuscula 1—3 pedalia. *Culmus* erectus, tenuis, triqueter, angulis acutis hispidis, foliis subæqualis. *Spicæ* sæpiùs duæ masculæ, totidem foemineæ—Mascula superior 1½—2 uncialis; inferior vix uncialis; ambæ lineares; f. filiformes, erectæ, squamis oblongis, acutis, nigro-ferrugineis, nervo dorsali viridi. *Spicæ* foemineæ sæpiùs duæ (aliquando unica tantum sese protrudit), ovatæ, erectæ, brevissimè pedunculatæ distantes.—Ad basin pedunculorum bractea, f. folium vaginans, vaginâ per brevi, pedunculum perbreve omnino fere amplectenti—Vagina in foliolum abit culmo paulò brevius—Squamæ ut in spicâ masculâ, capsulas subæquantes. *Capsula* hirta, five lanato-villosa, sub-triquetra, oblongiuscula, ore hiantè furcato.—*Filamenta* tria. *Stylus* stigmatibus tribus, villosis, crassiusculis.

Obs. Spica foeminea superior sæpè sessilis.

Anxious to determine this species, I solicited the honour of being permitted to consult Mr. *Lightfoot*'s herbarium, which is now,

as I have before observed, in her MAJESTY's possession.—I am therefore enabled to pronounce, that this plant is Mr. *Lightfoot's* *Carex tomentosa*.

It is readily distinguished from all *Carices* in its very foliage. Its leaves are narrow, very long, oftentimes a yard; and they end in a long and very taper point, something like the American *Dactylis cynosuroides*. In fructification it is equally distinct, by having generally two male spikes and never more, and capsules downy, almost woolly. This is in the Linnean herbarium with the name *filiformis* inscribed by *Linnaeus* himself, therefore we can have no doubt about its identity. It is somewhat surprising that *Linnaeus* never mentioned the downiness of the capsules—This omission naturally led Mr. *Lightfoot*, who otherwise suspected it to be *Linnaeus's* *filiformis*, to call it *tomentosa*.

The narrowness of the foliage being so remarkable, I wonder that *Linnaeus* did not take the hint from *Scheuchzer*, and name it *C. tenuifolia*.

I am much indebted to the Rev. Mr. *Williams* of *Eaton*, near *Shrewsbury*, for roots and specimens of this plant. I received roots also from my friend Dr. *Sibthorp* of *Oxford*, who was likewise indebted to Mr. *Williams* for them. Cultivated in a garden, it never, or rarely flowers.

24. CAREX FLAVA.

C. vaginis brevibus sub-æquantibus foliolo divaricato, spicâ masculâ lineari; fœmineis subrotundis, capsulis rostrato-acuminatis.

Buddle, Hort. Sic. p. 30. n. II.

Gramen cyperoides aculeatum Germanicum. *Mor. Hist. Ox. III.*

243. f. 8. t. 12. f. 19.

Gramen

Gramen palustre echinatum. *Ger.* 17. *Park.* 1187.

Fl. Suecica, n. 843. *Leers*, t. 15. f. 6. *Fl. Dan.* 1047. *Fl. Angl.* 407. *Fl. Scot.* 551. *Withering*, 1037.

Habitat in paludosis passim. Maio, Junio.

Radix repens, perennis. *Folia* amœnè viridia, ad margines carinamque asperiuscula, culmo longiora. *Culmus* erectus, triqueter, angulis acutis, glabris, altitudine varius, uncialis, pedalis, & ultra. *Spicæ* una mascula, tres foemineæ—*Spica* mascula terminalis, sublinearis, erecta, femuncialis-uncialis, sub-triquetra; squamis ovato-oblongis, obtusiusculis, fulvis, nervo dorsali viridi. *Spicæ* foemineæ modo omnes ad summitatem culmi congestæ; modo inferior remota, cæteris propè masculam congestis, modo, quod sæpe accidit, omnes a se invicem remotæ, subrotundæ, sed variant & præsertim inferior, oblongæ, pedunculo vaginâ suâ paulò longiori. Squamæ fere ut in masculâ, capsulâ breviores—Ad basin omnis pedunculi bractea, f. folium vaginans, vaginâ pedunculi longitudine. Veruntamen est ubi pedunculus inferior, præcipuè cum remotus sit, vaginam suam fere dimidio superat. Vagina in foliolum abit, culmo longius, divaricatum. *Capsula* sub-triquetra, ovata, rostrata, rostro sæpe sub-reflexo, ore plerumque indiviso, & ad basin spicæ, ex rotunditate f. contractione receptaculi, deorsum spectans. *Filamenta* ut in cæteris. *Stylus* stigmatibus tribus.

Obs. Variat sed rariùs spicis masculis duabus, tum culmi angulis asperiusculis.

The long divaricated foliaceous bractea is a very constant discriminating mark in this species: this, together with its round prickly heads, render the investigation perfectly easy.

It

It may however be difficult to keep it always distinct from the two following, which have been considered as varieties of it. The capsule is a good guide to distinguish it from *C. extensa*, being in *C. flava* oblong, with a long taper point, and in *C. extensa* ovate and acute. But the capsule is no guide in its separation from *C. fulva*, being apparently the same. *C. flava* has always three female spikes, and *C. fulva* as constantly two—Then *C. flava* has its bractæe divaricated; *C. fulva* upright, particularly the lowest. The division of the apex of the capsule has always appeared to me constant in *C. fulva*, but is by no means so in *C. flava*. The habit of these two plants seems very different. And the female spikes in *C. fulva* are always acute, and never round.

25. CAREX EXTENSA. TAB. 21. fig. 7.

C. vaginis brevissimis æquantibus foliolo sub-reflexo, spicis confertis; foemineis sub-rotundis, capsulis ovatis acutis.

Buddle, Hort. Sic. p. 30. n. 10.

Carex flava, Var. β. Hudf. Flora Anglica, p. 407.

Habitat in palustribus, propè Harwich—On the marshy part of Branton Burrows in Devonshire. Junio.

Radix ——— perennis. *Folia* radicalia sub-angusta, culmo breviora (quæ autem culmi basin amplexantur, eundem sæpe æquant, sæpe superant) summitatem versus marginibus carinâque asperiusculis. *Culmus* erectus, pedalis & ultra, triqueter, angulis obtusiusculis, glabris. *Spicæ* una (rarius duæ) mascula; duæ, sæpe tres, foemineæ. *Spica* mascula linearis, femuncialis & ultra (si duæ adfint altera quintuplo brevior) terminalis; squamis fuscis, nervo dorsali viridi, oblongis, sub-obtusis. *Spicæ* foemineæ sæpius ad basin

basin masculæ, confertiusculæ; aliquando autem inferior remotiuscula, ovata (superiores sub-conicæ), acutiuscula; omnes plerumque breviter pedunculatæ; squamis ovatis, fuscis, nervo dorsali crassiusculo, qui in mucronem prominulum definit, capsulâ demum duplo brevioribus. Ad basin spicarum fœminearum bractea foliacea, quæ vaginâ suâ pedunculum totum, qui quidem omnino brevis est, amplectitur: inferior longissima, & culmum longissimè superat: superiores breviores; interdum superior culmo brevior. Omnes denique reflexæ. *Capsula* glabræ, patentes, sub-trigonæ, nervosæ, ovatæ, acutæ, apice in denticulos duos diviso, rostro (si rostrum fas sit dicere) brevissimo. *Filamenta* tria. *Stylus* stigmatibus tribus.

This plant has always, I believe, passed as a variety of *Carex flava*. However, the fructification proves it to be entirely distinct.

In *C. extensa* the leaves are narrower than in *C. flava*, and the whole plant is slenderer and taller. The squamæ of the female spikes are ovate and bluntish, with the nerve ending in a very short projecting point, and are shorter in proportion to the capsule than in *C. flava*. The capsules are rather acuminate, but by no means rostrated or beaked, and the summit is slightly bifid. The bractæ are usually reflexed. The female spikes have their peduncles only of the length of the vagina, and not longer. The capsules also are patent, but very rarely divaricated. This plant does not owe its height to being drawn up by the surrounding herbage, for I have always found it in open places.

I have found it in the marshy ground near *Harwich*, and in the marshy ground on the west side of *Braunton Burrows*, in the north of Devonshire. It is not a common plant.

Obs. The circumstance of the spikes being clustered together is very constant in this species, but it is by no means so in *C. flava*.

26. *CAREX FULVA*. TAB. 20. fig. 6.

*C. vaginâ infimâ subdimidiatâ; superioribus subæquantibus, spicis
fœmineis duabus oblongis acutis, capsulis rostrato-acuminatis.*

Carex distans. Fl. Dan. t. 1049.

Habitat propè Eaton, juxta Shrewsbury, in agro Salopienfi.

Rev. E. Williams. Junio, Julio.

Radix repens, perennis. *Folia* erecta, angusta, marginibus carinâque asperis, culmo breviora. *Culmus* erectus, tenuis, sub-pedalis, triqueter, angulis acutis, asperis. *Spicæ*, una mascula, duæ plerumque fœmineæ. *Spica* mascula terminalis, sub-linearis, femuncialis & ultra, acutiuscula; squamis flavescentibus, margine albo, oblongis, modo obtusis, modo obtusiusculis. *Spicæ* fœmineæ sæpius remotæ, ovato-oblongæ, acutæ, inferior pedunculata, pedunculo longiusculo, superior subsessilis; squamis oblongis, acutis, sæpe acutiusculis, capsulam fere æquantibus. Ad basin omnis *spicæ* fœmineæ bractea f. folium vaginans; inferior erecta, culmum plerumque æquans, vaginâ plusquam dimidium pedunculi amplectente; superior sub-divaricata, culmo plerumque brevior, pedunculum, qui profecto brevissimus est, totum fere vaginâ occupans—interdum totum occupat. *Capsulæ* sub-trigonæ, nervis striatæ, oblongæ, rostrato-acuminatæ, squamas sub-æquantes, sæpe excedentes, apice diviso, patentes, nec divaricatæ, aut deorsum spectantes.—*Filamenta* tria—*Stylus* stigmatibus tribus.

Obs. Variat, sed rarius, spicis fœmineis tribus.

This plant is scarcely removed from *C. flava*. However, it differs from it in having the angles of the culm sharp and rough. The female spikes are remote, oblong and acute, not round; the lowermost is supported by a long footstalk, half of which nearly

appears above the vagina. Besides, it has scarcely ever more than two female spikes. The lowermost bractea is erect, and not divaricated. The capsules are not divaricated, but patent, and are slightly divided at the summit. I regret that I have had no opportunity of cultivating it.

I am indebted to the *Reverend Mr. Williams* of *Eaton* near *Shrewsbury* for my knowledge of this plant as a native of Britain—I have received it from *America* and *Newfoundland*, but never understood till very lately that it was an inhabitant of our country.

27. CAREX DISTANS.

C. vaginâ infimâ ferè dimidiatâ; superioribus subæquantibus, spicis oblongis remotissimis, capsulis acutis.

Buddle, Hort. Sic. p. 29. f. 5.

Uvedale, Herb. Rayn. vol. 12. p. 66. n. 1.

Gramen cyperoides palustre, spicis tribus subrotundis vix aculeatis, spatio distantibus. *Mor. Hist. Ox. 243. f. 8. t. 12. f. 18.*

Carex spicis parvis longe distantibus. *Scheuchzer, 431. Withering, 1049. Fl. Angl. 412. Fl. Scot. 561. Fl. Dan. 1049.*

Carex panicea, Fl. Suecica, Var. α?

Habitat in palustribus, præcipuè maritimis. Junio.

Radix fibrosa, perennis. *Folia* pallidè virescentia, marginibus carinâque asperiusculis, culmum floriferum sub-æquantia. *Culmus* erectus, triqueter, angulis acutis, glabris, pedalis, bipedalis. *Spicæ*, una mascula, rarius duæ; tres foemineæ. *Spica* mascula terminalis erecta, sub-linearis, flavescent, quandoque nigricans, uncialis & ultra; squamis sub-flavescentibus, nervo dorsali viridi, marginibus albis, obtusis. *Spicæ* foemineæ oblongæ, unciales & ultra, erectæ,

erectæ, pedunculatæ, valdè remotæ; squamis acutiusculis, capsulâ brevioribus. Ad basin omnis pedunculi bractea f. folium vaginans. Vagina inferior non pedunculi longitudine, tamen plusquam dimidium occupat; superiores pedunculos suos æquant. Vaginæ in foliola abeunt spicis suis multoties longiora, at culmo breviora—*Capsulæ* sub-triquetræ, ovatæ, acuminatæ, ore sub-diviso. *Filamenta* ut in cæteris—*Stylus* stigmatibus tribus.

The remarkable distance at which the female spikes are placed from each other, is a distinction too obvious to admit of any doubt. *C. hirta* has them situated in the same manner; but the leaves are hairy, and the capsules villous, in that species—in *C. distans* they are both perfectly smooth.

It usually flowers in May and June.

28. CAREX PANICEA.

C. vaginâ infimâ subdimidiatâ; superioribus sub-æquantibus; spicis erectis remotis, capsulis inflatis obtusiusculis sub-distantibus.

Uvedale, Herb. Rayn. vol. 12. p. 62. n. 1.

Cyperoides foliis caryophylleis (caule rotundo-triquetro), spicis rarioribus & tumidioribus vesicis compositis. *Mich. Gen. t. 32. f. 11.*

Fl. Suecica, 853, Var. β.

Leers, t. 15. f. 5. Fl. Dan. 261. mala. Fl. Scot. 558. Withering, 1044.

Habitat in pratis & pascuis humidis. Maio, Junio.

Radix repens, perennis. *Folia* glauca, marginibus carinâque asperiusculis, culmo breviora. *Culmus* erectus, triqueter, angulis acutiusculis, glabris, sub-pedalis. *Spicæ*, una (rarius duæ) mascula,

circiter tres foemineæ. Spica mascula terminalis, oblonga, uncialis; squamis fulvis, oblongo-ovatis, acutiusculis. Spicæ foemineæ omnes a se invicem remotæ, ovatæ, erectæ, pedunculatæ, floribus laxè imbricatis, squamis oblongo-ovatis acutis, capsulâ brevioribus, nervo dorsali viridi.—Ad basin singuli pedunculi bractea f. folium vaginans, vaginâ inferiori circiter dimidium, aut paulo plus, pedunculi amplectente; cæteris pedunculos suos fere æquantibus. Hæ bracteæ in foliola desinunt culmo breviora, spicis suis longiora. Capsula pallida, subovata, basi compressiuscula, superne inflata, obtusiuscula, ore clauso, indiviso. Filamenta ut in cæteris.—Stylus stigmatibus tribus.

C. panicea, in its younger state, is very like the young specimens of *C. recurva*; but it is at once distinguished by the vagina.—In *panicea* the lowermost vagina is full half the length of the footstalk, in *recurva* about one quarter only. It is distinguishable also by its alternate distant capsules; in *recurva* they are crowded in a thicker spike.

29. CAREX CAPILLARIS.

C. vaginis dimidiatis, spicis foemineis oblongis laxis: fructiferis-pendulis, pedunculis capillaribus, capsulis acuminatis.

Fl. Scot. p. 557. *Fl. Dan.* t. 168. *Scop. Fl. Carniol.* 1152. t. 59.

Habitat in montosis Scotiis.

Radix fibrosa, perennis—*Folia* tenuissima, culmo fere triplo breviora. *Culmus* erectus, triqueter, angulis obtusiusculis, glabris, 2—5 uncialis. *Spicæ*, una mascula, duæ foemineæ, omnes ad summum
tatem

tatem culmi. Masculula erecta, oblonga, f. sub-linearis, flavescent; squamæ oblongæ, acutiusculæ. Fœmineæ ambæ ex eodem nodo prodeunt, pedunculatæ, mox pendulæ, oblongæ, paucifloræ—Bractea f. folium vaginans dimidium pedunculorum, qui capillares sunt, occupat. Vagina in foliolum exit culmo paulum longius. Squamæ deciduæ, ovatæ, obtusæ, sub-fulvæ, capsulâ breviores. Capsula ovata, rostrato-acuminata, ore indiviso. Stigmata tria.

Obs. Spica mascula admodum pauciflora.

The diminutive stature of this plant, its capillary peduncles, its female spikes pendulous, lax, with few flowers, from four to eight, and the squamæ of the same being *deciduous*, place it in too *conspicuous* a light to be mistaken.

I never have had the good fortune to see this plant growing; I have therefore been obliged to take my description from dried specimens.

30. CAREX DEPAUPERATA.

C. vaginis plusquam dimidiatis, spicis fœmineis remotis paucifloris, capsulis ovatis inflatis rostrato-acuminatis.

Cyperoides sylvarum angustifolium caule trilatero, spicis parvis, capsulis rarius dispositis, obesis, &c. *Mich. Gen.* p. 56. t. 32. f. 5. *Withering*, p. 1049.

Carex ventricosa. *Fl. Londin. bona.*

Habitat in sylvâ *Charlton* dictâ—In sylvis propè *Godalmin* in agro Surreiano. Maio, Junio.

Radix fibrosa, perennis. *Folia* pallidè virescentia, marginibus carinâque asperis; radicalia ad basin rufa, culmo breviora. *Culmus* erectus, pedalis, bipedalis, triqueter, angulis obtusiusculis, glabris. Spicæ,

Spicæ, una mascula, terminalis, linearis, squamis flavescentibus, nervo dorsali viridi, ovato-oblongis, acutiusculis. Spicæ foemineæ remotæ, longè pedunculatæ, erectæ, paucifloræ—quæque scilicet spica circiter 3—6 flores gerit. Flores laxè dispositi. Squamæ flavescentes, nervo dorsali viridi (qui nervus in mucronem definit), oblongo-ovata, acutæ, capsulâ fere dimidio breviores. Ad basin omnis pedunculi bractea f. folium vaginans, quod circiter tertiam partem pedunculi, nec dimidium, amplectitur. Vagina in foliolum abit sæpissimè culmo longius. Capsula oblongo-ovata, inflata, sub-triquetra, erecta, rostrata, ore indiviso. Filamenta tria, antheris linearibus flavis. Stylus stigmatibus tribus.

Obs. Capsulæ sæpius bifariam imbricatæ.

I do not hesitate to adduce the synonym and figure of *Micheli*. It certainly belongs to this plant, as any one may satisfy himself who will take the trouble to observe how accurately the vaginæ are represented. In the *vesicaria*, to which it has been applied, there are no vaginæ—In this they embrace almost half of the peduncle or footstalk. *Micheli*'s figure plainly conveys this idea.

Its distant long-pedunculated spikes, and few capsules, readily distinguish this species from all others. This last circumstance induced the late Dr. *Solander* to name it in his MSS. *C. depauperata*, whom Dr. *Withering* first followed.

Mr. *Curtis* has given us an excellent figure of it under the name of *Carex ventricosa*.

I had the good fortune to find this species in *Charlton* wood—Mr. *Dickson* has told me that it is not unfrequent in dry woods near *Godalmin* in *Surrey*. I apprehend, from the form of the capsule, that it has been taken for a starved variety of *C. vesicaria*; as

I cannot

I cannot think it possible that a plant of this size, in the neighbourhood of London, could have escaped so long unnoticed. Probably the vagina was never attended to.

31. CAREX SYLVATICA.

C. vaginis abbreviatis, spicis filiformibus laxis pendulis, capsulis ovatis aristato-rostratis.

Buddle, Hort. Sic. p. 29. n. 4.

Uvedale, Herb. Rayan. vol. 12. p. 67. n. 1.

p. 69. n. 1.

p. 73. n. 1.

Gramen cyperoides sylvarum tenuius spicatum.

Morif. Hist. Oxon. III. 243. f. 8. t. 12. f. 9.

Park. 1172. Scheuchzer, 418.

Leers, 15. 2. Withering, 1047. Fl. Dan. 404. Fl. Angl. 411.

Fl. Scot. 562.

Carex patula. Pollich. n. 896.

Habitat in sylvis passim. Maio, Junio.

Radix fibrosa, perennis. *Folia* pallidè virescentia, ad margines carinamque supernè hispida, culmo breviora. *Culmus* bipedalis & ultra, erectus, triqueter, angulis supernè obtusiusculis, glabris. *Spicæ*, una (rarius duæ) mascula, circiter sex foemineæ, omnes a se invicem remotæ. Spica mascula terminalis, erecta, linearis, triquetra, uncialis, biuncialis, atque etiam ultra. Squamæ flavescentes, basi albâ, nervo dorsali viridi, oblongæ, acutæ. Spicæ foemineæ longius pedunculatæ, citò pendulæ, filiformes, floribus laxè imbricatis. Squamæ flavescentes, nervo dorsali viridi, ovatæ, acuminatæ, capsulâ breviores. Ad basin omnis pedunculi bractea f. folium vaginans.

vaginans, cujus vagina circiter quartam partem pedunculi amplectitur. Vagina in folium abit suâ spicâ paulò longius. Capsula ovata, acuminata, rostrata, rostro tenui, ore indiviso. Filamenta ut in cæteris.—Stylus stigmatibus tribus.

None of the figures of this plant, except that of *Leers*, give its due character. The figures of *Morison*, *Parkinson*, and *Fl. Danica*, represent it in its first stage of flowering when the spikes are erect. It does not long continue in this attitude; for the spikes, by reason of their thin and long footstalks, as soon as the impregnation of their flowers has taken place, are too heavy for their weak supporters. It usually produces five or six female spikes, and one male, very rarely two.

Every one must be surpris'd at *Linnaeus*'s joining this as a variety to *vesicaria* and *ampullacea*.

32. CAREX RECURVA.

C. vaginis abbreviatis, spicis foemineis sub-cylindricis pendulis, capsulis rotundato-ovatis, radice repente.

Buddle, Hort. Sic. p. 30. n. 3. 4.

Gramen nemorosum spicâ subnigrâ recurvâ. Moris. Hist. Ox. f. 8. t. 12. f. 14.

Carex limosa. Leers, Var. β. t. 15. f. 3. Fl. Angl. p. 413. Withering, 1050. Fl. Dan. 1051.

Habitat in pratis, pascuis, nemoribus & ericetis. Maio, Junio.

Radix repens, perennis. Folia glauca, pro magnitudine plantæ latiuscula, marginibus carinâque asperissima. Culmus erectus, triquetus, angulis acutiusculis, glabriusculis, foliis radicalibus longior, pedalis. Spicae, una (sæpè duæ, rarò tres) mascula, tres foemineæ.

Spica mascula terminalis, oblonga, sub-cylindrica, plus minusve uncialis, squamis nigro-ferrugineis, oblongis, obtusis, nervo dorsali viridi, margine membranaceo albo. Spicæ fœmineæ sub-cylindricæ, unciales, fescunciales, longius pedunculatæ, primum erectæ, mox maturiores pendulæ, remotæ. Ad basin pedunculorum bractea, vaginâ abbreviatâ, f. vix quartam partem pedunculi amplectente, utrinque basi auriculata, auriculâ sub-rotundâ. Vagina in folium definit culmo sæpè longius. Squamæ oblongæ, acutæ, capsulâ paulo breviores. Capsula ovata, sub-triquetra, obtusiuscula, ore clauso, primum viridis, inde gradatim flavescent, ferruginea, nigra, sub lente sub-tomentosa. Filamenta tria. Stylus stigmatibus tribus, crassiusculis, villosis.

Although no *Carex* can be said to vary more in size and habit than this, yet, to an attentive observer, there will be no difficulty in determining it. Its cylindrical pendulous black spikes, its glaucous leaves, short vaginæ, roundish capsules, smooth culm, and creeping root, are obvious distinctions.

It seems strange that so common a *Carex* as this is should have been so little noticed by the old authors. I recollect no old figure of it beside *Morison's*—that indeed characterises it sufficiently. *Leers's* figure is tolerable; he seems to have joined *C. limosa* his Var. α , and *recurva* his Var. β . in one—which is a confusion very unusual to his general consummate accuracy.

I should almost have apprehended that Mr. *Lightfoot* had intended this plant by his *C. cæspitosa*, Var. α . had he not expressly mentioned that it had only two stigmata—whereas this invariably has three, and protrudes them in a manner not easy to be mistaken, being thicker, longer, and more villous than in the generality of this family.

33. CAREX PALLESCENS.

C. vaginis abbreviatissimis, spicis foemineis sub-cylindricis: fructiferis pendulis, capsulis oblongis obtusis.

Buddle, Hort. Sic. p. 30. n. 5.

Gramen cyperoides polystachion flavicans, spicis brevibus propè summitem caulis. *Mich. Gen.* 61. t. 32. f. 13. *Pluk.* t. 34. f. 5.

Sp. Pl. 1386. *Fl. Suecica*, n. 852. *Leers*, t. 15. f. 4. *Fl.*

Angl. 410. *Withering*, p. 1043. *Pollich.* n. 889. *Fl. Scot.* 558.

Fl. Dan. 1050.

Habitat in fylvis, pratis, & pascuis humidis. Maio, Junio.

Radix fibrosa, perennis. *Folia* angusta, pallida, ad margines carinasque scabriuscula, culmo dimidio breviora, pilosa. *Culmus* erectus, pedalis, sesquipedalis, triqueter, angulis supernè acutissimis, infernè obtusiusculis, asperis. *Spicae*, una mascula, tres foemineae, omnes ad summitem culmi approximatae. Spica mascula terminalis, oblonga, triquetra, semuncialis; squamis flavescentibus, nervo dorsali viridi, acutiusculis. *Spicae* foemineae sub-cylindricae, obtusae, pedunculatae, mox pendulae; squamis ovatis, acutis, capsula paulò brevioribus. Ad basin pedunculorum bractea, quae culmum longè superat, vaginâ brevissimâ, ne quidem octavam pedunculi partem amplectenti. Flores densè imbricati. *Capsula* pallida, viridis, oblonga, obtusa, ore integro.—*Filamenta* & *antherae* ut in cæteris.—*Stylus* stigmatibus tribus.

None of the figures give a good representation of the female spikes in their mature state—at that time they are nearly cylindrical, whereas in the figures here quoted we have only the ovate form, in which they appear when first in flower.

34. CAREX LIMOSA.

C. vaginis abbreviatissimis sub-nullis, spicis foemineis ovatis pendulis, capsulis ovatis compressis, radice repenti.

Cyperoides spicâ pendulâ brevior, squamis e spadiceo vel fusco rutilante viridibus. *Scheuchzer*, 443. t. 10. f. 13.

Flor. Suecic. n. 850. *Fl. Angl.* 409. *Withering*, 1041. *Pollich.* n. 888. *Fl. Dan.* 646.

Habitat in paludibus turfosis, in comitatibus Eboracensi, Lancastriensi, Westmorelandico, &c. passim. Junio.

Radix repens, perennis. *Folia* glauca, erecta, tenuia, marginibus carinâque aspera. *Culmus* erectus, triqueter, angulis acutis, asperiusculis. *Spicæ*, una mascula, duæ foemineæ. Spica mascula terminalis, oblonga, sub-linearis; squamis flavescentibus f. subferrugineis, oblongis, acutis. Spicæ foemineæ longius pedunculatæ, mox pendulæ, ovatæ, acutiusculæ; squamis ovatis, acutis, sæpe mucronatis, fuscis, nervo dorsali viridi, capsulâ paulo longioribus. Ad basin pedunculorum bractea culmo longior, quæ vix ac ne vix quidem ullam partem pedunculi complectitur. *Capsula* sub-compressa, nervosa, ovata, mucronata, ore integro. *Filamenta* ut in cæteris. *Stylus* stigmatibus tribus.

This plant has been confounded with *recurva*, from which it is readily distinguishable by its very short vaginæ, by its ovate spikes, and by the shape and colour of its capsules, which are compressed; of a cæsius green colour when young, and brown when ripe; not round, ovate, and black as in *recurva*.

Upon cultivating it, I observed, that it frequently threw up barren leafy stalks; upon cutting these off, and planting them in

pots plunged in water, they readily took root, and formed luxuriant plants. The name *stolonifera* would have been peculiarly proper for it.

This species, when cultivated in a garden, rarely flowers. In a wild state I have never seen it with more than *two* female spikes, usually with *one* only.

35. CAREX PSEUDO-CYPERUS.

C. vaginis sub-nullis, spicis foemineis cylindricis pedunculatis pendulis, capsulis aristato-rostratis sub-divaricatis.

Uvedale, Herb. Rayan. vol. 12. p. 65. C.

Pseudo-cyperus, Ger. em. 29. Park. 1266.

Gramen cyperoides spicâ pendulâ breviori. Mor. Hist. Ox. III. 242. f. 8. t. 12. f. 5.

Fl. Suecica. 854. Fl. Angl. 410.

Fl. Scot. 559. Pollich. n. 891. Withering, 1045.

Habitat in nemorosis humidis, & ad ripas fossarum. Junio.

Radix fibrosa, perennis. *Folia* pallidè viridia, lata, canaliculata, marginibus carinâque asperis, culmo ferè duplo longiora, omnia longitudine ferè æqualia. *Culmus* pedalis & ultra, ad summum ferè foliosus, erectus, triqueter, angulis acutis, asperis. *Spicæ*, una mascula, quatuor foemineæ; omnes lineares, tenues, pallidæ. Spica mascula terminalis, sub-triquetra, bracteata, bractea fetacea, spicâ dimidio breviori; squamis sub-fetaceis, pallidis, nervo dorsali viridi, ad apicem marginibus carinâque hispidis. *Spicæ* foemineæ pedunculatæ; pedunculo spicâ suâ longiori, teretes, fructiferæ pendulæ; intermediæ geminatæ, cæteræ solitariae; squamæ ut in spicâ masculâ, capsulas sub-æquantes. Ad omnem spicam foemineam bractea

tea foliacea, inferior *culmum* longè superans, cæteræ etiam *culmum* superantes; omnes subseffiles, aut basin pedunculi, brevissimè quidem, amplexantes. *Capsulæ* oblongæ, striatæ, medio sub-ventricosæ, rostratæ, rostro longo, tenui, apice diviso, f. sub-furcato, sub-divaricatæ.—*Filamenta* tria.—*Stylus* stigmatibus tribus, albis.

Linnaeus took his character of this plant from its having two *peduncles* rising from each joint of the *culm*. However, that is so very uncertain a mark, that it is not possible to place any dependence upon it. The circumstance of its having no *vaginæ*, or at best very minute ones, and *capsules* nearly divaricated, and ending in a long point, represents it in a sufficiently-distinguishable light. The intermediate *peduncles* are not unfrequently found doubled.

36. CAREX ATRATA.

C. vaginis sub-nullis, spicis omnibus androgynis terminalibus pedunculatis: fructiferis pendulis, capsulis ovatis acutiusculis.

Cyperoides Alpinum pulchrum foliis caryophylleis, spicis atris & tumentibus.

Scheuchzer, p. 481. t. 11. f. 1. 2.

Fl. Suecica, 849. *Fl. Anglica*, 409. *Fl. Dan.* 158.

Fl. Scot. 555. *Withering*, 1040.

Habitat in montibus Cambro-Britannicis & Scoticis. Maio, Junio, Julio.

Radix fibrosa, perennis. *Folia* lata, culmo breviora, carinata, marginibus carinâque asperis. *Culmus* erectus, triqueter, angulis acutis asperiusculis, pedalis. *Spicæ* non sexu distinctæ, quippe summa non mascula, at plerumque foeminea, & ad basin flores masculos gerit, nec non quosdam hermaphroditicos sparsos, quod etiam

etiam in cæteris quandoque accidit. Spicæ omnes oblongæ, acutæ, femunciales, pedunculatæ, pedunculo longo, demùm pendulæ, approximatae. Squamæ ovatae, acutæ, nigræ, nervo tenuiori dorsali, viridi, capsulâ paulò longiores. Ad omnem pedunculum bractea foliacea; infima culmo plerumque longior, sed variat brevior, subseffilis: est ubi inferior basin pedunculi, at brevissimè, amplectitur. *Capsula* viridis, ovata, sæpe acuta, compressa, apice breviter diviso. *Filamenta* duo, antheris linearibus flavis. *Stylus* stigmatibus tribus, villosis.

This species with us has all its spikes androgynous; in strict justice, therefore, it should be arranged under the order *Spicis androgynis*. But there is something in its habit so perfectly conformable to those styled *Spicis sexu distinctis*, that rigid rule must give way:—the singularity in this species is, that it has for the most part only two stamina, and a few hermaphrodite flowers.

Its having no vaginæ, or at least very minute ones, and black ovate spikes, are marks sufficient to distinguish it readily from all others with which it can come in any competition.

The specimen in the *Linnean herbarium* seems to be the same as our English plant; but that has its terminal spike evidently male.

Scheuchzer's figure gives no bad representation of the hermaphrodite flower.

37. CAREX PILULIFERA.

C. vaginis nullis, spicâ masculâ sub-lineari, foemineis subrotundis seffilibus confertis, culmo debili.

Buddle Hort. Sic. p. 30. n. 9.

Gramen cyperoides tenuifolium, spicis ad summum caulem seffilibus globulorum æmulis. *Pluk. ph. t. 91. f. 8.*

Mor. Hist. Ox. III. 243. f. 8. t. 12. f. 16.

C. mon-

C. montana. *Fl. Suecica*, n. 845. *Leers*, t. 16. f. 6.

C. pilulifera. *Sp. Pl.* 1385. *Fl. Angl.* 408. *Fl. Scot.* 554.

Withering, 1039. *Fl. Dan.* 1048.

Habitat in pascuis & ericetis humidis passim. Aprili, Maio.

Radix fibrosa, perennis. *Folia* ex flavescenti amœnè viridia, tenuia, culmo breviora, marginibus carinâque apicem versus hispida. *Culmus* debilis, incurvus, sæpiùs recumbens, triqueter, angulis acutis sub-lævibus, 3—6 uncialis, & ultra. *Spicæ*, una mascula, & circiter tres fœmineæ. Spica mascula terminalis, linearis, aliquando oblongiuscula, tenuis; squamis oblongo-ovatis, acutis, fuscis, nervo dorsali viridi, margine tenero albido. Fœmineæ tres, ad basin masculæ, approximatae, oblongæ, acutæ, maturiores subrotundæ; duæ inferiores bracteâ brevi, foliaceâ, sessili, subtenduntur; superior bracteâ membranaceâ, ovatâ, carinatâ, quæ denuò in mucronem foliaceum definit; squamæ fere ut in masculâ sed pallidiores, capsulam maturam subæquantes. *Capsula* mox nigricans, subrotunda, sub-tomentosa, mucronata, mucrone brevi obtusiusculo, apice indiviso. *Filamenta* ut in cæteris. *Stylus* stigmatibus tribus.

Obs. In spicis fœmineis, flores terminales plerumque masculi. Post breve tempus hi decidui sunt, unde spicæ sæpiùs rotundæ evadunt. Spica inferior variat, sed rarius, breviter pedunculata.

I own that I still hesitate what name I ought to add to this species. Dr. *Smith* tells me, it certainly is the *C. montana* of the Linnean herbarium; and that, from the quotation of *Plukenet's* figure, we may be equally certain *Linnaeus* described it from thence as his original *C. pilulifera*, without having a specimen in his collection.

lection. It must be confessed, that the plant in the Linnean herbarium, *afterwards* gathered by Dr. Solander in Lapland, and named *pilulifera*, is very different from this I am now treating of. It is very robust and erect, the spikes also are larger and more crowded, neither is there any male spike to be seen. Probably it is the *Carex alpina* of the *Fl. Danica* 403. It must therefore be concluded that that was not the plant which *Linnaeus* originally intended. I have no doubt but he spoke of one and the same plant under two names. I should think that in its more fruitful state, with three female spikes, he called it *pilulifera*: in its more starved appearance, when produced on elevated and dry plains, where it has only two, and not unfrequently only one female spike, he called it *montana*.

The figures in *Plukenet* and *Morison* are very expressive, but are too erect. The roundness of the female spikes happens from the terminal flowers being usually male and deciduous: as these wither away, the spikes assume their round form, otherwise they are in general oblong. The capsules are somewhat downy, as in *C. præcox*, but the linear male spike, the female ones sessile, and the reclining culm, mark its distinction in all stages of its growth.

Mr. *Hudson* having adopted the name *pilulifera*, and in consequence that name having universally obtained with us, not to mention that it is more expressive than *montana*, I thought it best, upon mature deliberation, to continue it.

38. CAREX RIGIDA. TAB. 22. fig. 10.

C. digyna, vaginis nullis, spicis oblongis sub-fessilibus, foliis sub-recurvis rigidis.

Cyperoides germanicum, foliis brevibus rigidis acutis, &c. *Mich. Nov. Gen.* p. 61. t. 32. f. 4.

Carex saxatilis. *Fl. Angl.* 408.

Carex saxatilis *Flor. dan.* 159

Habitat in summo vertice montis Snowdon. Mr. Hudson.

In alpidibus Scoticis. Mr. Dickson.

Aprili, Maio.

Radix crassa, valde repens, perennis. *Folia* rigida, nigro-viridia, glaucescentia, marginibus carinâque apicem versus asperis, recurva, culmo paulò breviora. *Culmus* erectus, sæpe incurvus, circiter $4\frac{1}{2}$ uncias altus, triqueter, angulis acutissimis asperis, præ cæteris suæ altitudinis crassus, rigidus. *Spicæ*, unica mascula (rariùs duæ), duæ, tres foemineæ, ad summum culmi approximatae—Spica mascula terminalis, oblonga, acutiuscula, circiter $\frac{3}{4}$ unc. longa; squamis nigris, ovatis, obtusissimis, margine membranaceo, nervo abbreviato dorsali viridi—Spicæ foemineæ mari approximatae, inferior remotiuscula, oblongæ, acutiusculæ, fessiles (inferior sæpè pedunculata), longitudine maris, floribus densè imbricatis, flore uno aut altero terminali, præcipuè in spicis superioribus, masculino; squamæ nigræ, ovatae, obtusissimæ, &c. ut in masculâ, demum capsulâ dimidio breviores. Ad spicas foemineas bractea foliacea fessilis, basi utrinque auriculatâ—quæ ad spicam inferiorem sita est, spicâ suâ longior est, & recurva—quæ ad superiores, erectæ, & spicis suis breviores,

basi pariter auriculatæ. *Capsula* ovata, hinc planiuscula, glabra, obtusiuscula; variat autem producta, acutiuscula, sub-recurva.—*Filamenta* ut in cæteris. *Stylus* stigmatibus duobus, crassiusculis, albis, pilosis.

Obs. Flores inferiores sæpè remotiusculi. *Capsulæ* ore indiviso. *Bractearum* auriculæ fatis magnæ, sub-rotundæ.

This plant has often been confounded with the *saxatilis* of *Linnaeus*, and the *montana* of Mr. *Hudson*. It differs from the *montana*, by its having no vaginæ, two stigmata, and smooth capsules; from the *saxatilis*, by its being a thicker and much smaller plant; and from both, by the great rigidity of its leaves and incurved stalk. In Sir *Joseph Banks*'s herbarium is a fine specimen collected by Mr. *Hudson*, the culms of which are much incurved. I have cultivated this plant, and find that the culm keeps the tendency to incurvation. I should apprehend that the bleak exposure on the tops of mountains contributes to the incurvation observable in its wild state.

The rigidity of its leaves, and their being spread abroad, or, as it oftener happens, bent back, distinguish it from *cæspitosa*, whose leaves are upright and soft. By the same marks it may always be kept separate from *C. stricta*, which also is altogether upright. But the fructification of these three species, especially in the number of styles, is very similar.

It is possible that the root leaves of this plant, arched back, and of a firm nature, may afford protection to many of the winged inhabitants of the windy tops of alpine situations.

Considering the cold situation of the natal soil of this plant, it
 2 seems

seems somewhat surprising that, when planted in a garden, its leaves should wither at the first approach of winter; but even in that state they retain much of their rigidity.

I am indebted to that acute observer, Mr. *Dickson*, for plants of this species brought by him from *Scotland*, where it is frequent upon the tops of high hills.

39. CAREX CÆSPITOSA. TAB. 21. fig. 8.

C. digyna, vaginis nullis, spicis sub-fessilibus sub-cylindricis obtusis, foliis erectis molliusculis.

Buddle Hort. Sic. p. 30. n. 2.

Fl. Suecica, n. 855.

Habitat in palustribus, in nemorosis humidis. Maio.

Radix valdè repens, perennis. *Folia* molliuscula, amœnè viridia, sub-glauca, erecta, culmum æquantia, marginibus carinâque apicem versus asperiuscula. *Culmus* erectus 4-12 uncialis & ultra, sub-debilis, triqueter, angulis acutis, asperiusculis. *Spicæ*, una mascula (rariùs duæ), tres foemineæ. Spica mascula erecta, terminalis, oblonga, triquetra, $\frac{1}{4}$ -1 unciam longa; squamis ovatis, obtusis—Spicæ foemineæ duæ aut tres, sub-cylindricæ, obtusæ, sub-fessiles—scilicet inferior breviter pedunculata, superiores fessiles. Flores plerumque sexfariàm, rarò octofariàm, densè imbricati—Squamæ ovatæ, acutiusculæ (sed variant nec infrequenter obtusæ), capsulâ maturâ breviores, nigræ, nervo dorsali viridi. Ad spicas foemineas bractea foliacea, erecta, fessilis, i. e. culmum ne minimè quidem amplectens,

basi utrinque auriculata, auriculâ nigrâ rotundâ persistenti, culmum modo æquans, plerumque superans, interdum brevior. *Capsula* ovata, obtusiuscula, sub-compressa, glabra, apice indiviso. *Filamenta* ut in cæteris. *Stylus* stigmatibus duobus.

Obs. *Capsulæ* persistentes, nec deciduæ.

Having spoken very fully of this plant in my remarks upon *C. stricta*, I have only in this place to say, that this plant has been generally mistaken in consequence of the various assertions of authors who have written upon it. It was not till after repeated and careful examinations of the Linnean herbarium, that I could determine it; for the specimens there preserved seem chosen ones, and of course do not appear at first sight to bear that exact resemblance to the general habit which is observable with us. I was relieved from all doubt by Mr. *Afzelius*, who, from his intimate and accurate knowledge of the Swedish plants, and not less perhaps of those of our country, traced out to me *certain* marks of similarity.

Obs. The capsules usually adhere to the rachis of the spike, even in decay. In *C. stricta*, they are deciduous as soon almost as they come to maturity—*C. caespitosa* comes into flower a very considerable time after *C. stricta*, nearly or quite a month.

40. CAREX STRICTA. TAB. 21. fig. 9.

C. digyna, vaginis nullis, spicis sub-sessilibus cylindricis acutis; masculis sub-duabus, foliis erectis strictis.

Gramen

Gramen cyperoides palustre spicâ pendulâ.

Loef. Pruss. p. 116. t. 30.

C. cæspitosa. *Fl. Angl.* 412. *Fl. Scot.* p. 560. var. β .

Habitat in palustribus. Propè Norwich. *D. Pitchford.*
Aprili.

Radix valdè repens, perennis. *Folia* glaucescentia, erecta, rectissima, culmo breviora, marginibus carinâque asperis. *Culmus* pedalis, bipedalis & ultra, erectus, triqueter, angulis acutis asperis. *Spicæ* masculæ plerumque duæ, foemineæ tres, omnes erectæ, subcylindricæ, acutæ. *Spicæ* masculæ triquetrae 1—2 unciales, squamis oblongis, acutiusculis, nigris, nervo dorsali viridi. *Spicæ* foemineæ 1—2 unciales, infima breviter pedunculata, cæteræ sessiles, floribus masculis terminatæ, & inde acutæ; squamæ oblongæ acutæ, capsulis octofariam imbricatis, paulò breviores. Ad spicas foemineas bractea foliacea, sessilis, erecta, inferior culmo plerumque paulò brevior (sed variat culmo longior, necnon longè brevior), junior sæpiùs auriculata, auriculâ oblongiuscula, citò elongatâ, mox evanidâ—superiores breviores, pariter auriculatæ. *Capsula* compressa, ovata, acuta, glabra, apice indiviso. *Filamenta* ut in cæteris. *Stylus* stigmatibus duobus, albis, crassiusculis, villosis.

Obs. Folia radicalia, quæ basin culmi amplectuntur, vaginam hinc membranaceam habent: membrana autem culmo luxurianti, mirè disrumpitur, & quasi in filamenta reticulato-connexa laceratur. Capsula citiùs decidua.

This *Carex* has many particulars in common with the *cæspitosa*; its upright culm and leaves, no vaginæ, sessile spikes, and to appearance digynous flowers: hence many have thought them the same.

same species. I am quite of a different opinion.—In the first place, *C. stricta* has the root-leaves which embrace the base of the culm, with the membranous part of the vagina, split into threads after the manner of open net-work: then the root-leaves and the bracteæ are shorter than the culm at the time of flowering. Add to this, the bracteæ, particularly the lowermost, have either no auricles, or oblong ones, which are presently so elongated as to disappear, i. e. to lose all form of auricles. The female spikes are acute, owing to their having male flowers at the summit. The scales are all acute—their capsules are set in eight rows, and two male spikes for the most part terminate the culm.

On the contrary, *C. cæspitosa* has the root-leaves, which embrace the base of the culm, with the membranous part always entire.—The root-leaves equal the culm in point of length at the time of flowering, the bracteæ are longer—The bracteæ always have little round auricles on each side of the base, which do not change their shape: the female spikes are obtuse, and have no male flowers at their summit. The scales (though sometimes they may be somewhat acute) are in general bluntish, not unfrequently very much so—The capsules are generally set in six, very rarely in eight rows, and it is seldom found with more than one male spike; besides, it is every way a much smaller, weaker, and softer plant. I speak here of the *general* appearance of these two species.

I have little doubt but *Loesel* meant this plant, though he speaks of it *spicâ pendulâ*; I suppose he means with an inclining stalk. He does not say, *spicis pendulis*—that would have been decisive against me; but *spicâ pendulâ*, i. e. as I interpret him, with that part of the culm which bears the spikes, inclining: not that I ever scarcely observed it even so, for it is in general remarkably upright in its stature. Most probably *Loesel* drew his figure from a dried specimen.

specimen. However, the habit of the plant which he has figured, the shortness of the leaves, and the apparent strictness of the culm, make me look upon it to be *C. stricta*. Had it been drawn upright, there would have been little or no doubt.

I should suppose that Dr. *Withering* meant this plant for his *cæspitosa*: but in some particulars the descriptions do not accord; perhaps they are taken from *cæspitosa* and *stricta* promiscuously, on a supposition that they are the same.

The younger *Linnaeus* once told me, that this was his father's *C. acuta*, var. *ruffa*. i. e. the var. α of the *Flora Suecica*, to which is quoted *Michelius's* figure t. 32. f. 12. which is there said to be exact. (We were examining a living plant in Kew-garden when this conversation passed). Now that figure has the female spikes with longish peduncles, which I never have observed the *stricta* to have. Had the spikes been sessile, it would have been a very decent representation of it. It could not be the *acuta* var. β of *Flora Suecica*, for that is, as appears evidently in the *Linnean herbarium*, the *C. gracilis* of Mr. *Curtis*. Certainly the growth of this plant answers to the name of *acuta* better than any other, having all its parts erect and sharp pointed. I wished to have named it so; but as the *gracilis* of Mr. *Curtis* is preserved in the *Linnean herbarium* under the name of *acuta* (by which means we are sure of one of the varieties), and as this has its title of *acuta*, var. *ruffa*, only from a conversation held accidentally with the younger *Linnaeus*, I do not venture to change the name upon this authority. There would, I own, be great propriety in calling this plant *acuta*, and suffering Mr. *Curtis's* very apt appellation of *gracilis* to remain with the other.

I must confess that I have but little doubt of this being the *acuta* var. *ruffa* of *Linnaeus* *.—It is the only plant which accords with

* Since the reading of this paper, the Baroness d'Itzenplitz favoured me with a sight of some *Carices*, sent her from Upsal, among which I observed this plant named *acuta*.

Mr. *Curtis's gracilis*, in the leading points of the Linnean character: *Spicis masculis pluribus, floribus digynis.*

It is observable, that *Micheliüs's* figure has the female spikes acute, rendered so by the male flowers at the top; which appearance no *Carex* has so constantly as this.

Some years ago I received roots of this plant from Mr. *Pitchford* of *Norwich*: I have cultivated it ever since, together with *C. cæspitosa*; neither have I observed either of them vary from the description given above.

41. CAREX RIPARIA.

C. spicis oblongis acutis; masularum squamis lanceolatis: foeminearum aristato-acuminatis, capsulis ovato-lanceolatis apice furcato-dentatis.

Petiv. Hort. Sic. vol. 1. p. 157.

Buddle, Hort. Sic. p. 28. n. 3, 4.

Cyperoides aquaticum maximum, &c. squamis in aristam longius productis, capsulis oblongis, bifidis. Michel. Nov. Gen. p. 57. t. 32. f. 6, 7.

Gramen cyperoides latifolium spicâ rufâ caule triangulo. Mor. Hist. Ox. III. f. 8. t. 12. f. 1.

Carex acuta, var. α. Hudf. Fl. Angl. p. 413. Fl. Scot. p. 565.

Carex riparia, Flora Londin. & Withering, p. 1056.

Habitat ad ripas fossarum fluviorumque; in palustribus, & pratis humidioribus. Aprili, Maio.

Radix valdè repens, crassa, perennis. *Folia* lata, erecta, supra pallidiora, subtus nigro-viridia, glauca, marginibus carinâque asperri-
mis,

mis, culmum inflorescentem sub-æquantia—quæ culmi basin ambiunt, vaginâ nervosâ, nervis pulchrè reticulatis. *Culmus* erectus, firmus, triqueter, angulis acutissimis, asperis, bipedalis & ultra. *Spicæ* tres masculæ, totidem fœmineæ. *Spicæ* masculæ terminales oblongæ, acutæ, triquetræ, angulis acutis, confertæ; squamis lanceolatis, acuminatis, nigris, nervo dorsali viridi. *Spicæ* fœmineæ oblongæ, & præ floribus terminalibus plerumque masculis acutæ: una aut altera inferior pedunculata, pedunculo sæpè longiusculo, superiores subsessiles, omnes erectæ. *Squamæ* lanceolatæ, aristato-acuminatæ, nigræ, nervo dorsali viridi, capsulâ longiores. Ad spicas fœmineas bractea foliacea; una aut altera inferior culmum sæpiùs longè superans, pedunculi basin vaginâ brevissimâ occupans: superiores subsessiles, basi plerumque auriculatæ, auriculatâ rotundiusculâ, culmum aut æquantes aut paulò breviores, tenuiores. *Capsulæ* sub-octofariam imbricatæ, oblongo-ovatæ, acuminatæ, apice diviso furcato, nervosæ. *Filamenta* tria, antheris linearibus flavis. *Stylus* stigmatibus tribus.

There is scarcely a possibility of mistaking this plant for any other. Its black, triangular, acute male spikes, and acuminate bifurcated capsules, must ever point out a most decided distinction.

He who would wish to obtain farther information, would do well to consult the excellent figure and observations of Mr. *Curtis* in his *Flora Londinensis*, or Mr. *Lightfoot*'s accurate description in his *Flora Scotica*.

It varies a little occasionally as to the robustness of its stature, and is met with sometimes with blunt male spikes. *Buddle*'s No. 4. is an instance of it.

42. CAREX PALUDOSA.

C. spicis oblongis sub-obtusis; mascularum squamis obtusis: foeminearum lanceolatis, capsulis ovato-lanceolatis apice sub-dentatis.

Carex acuta. Fl. Londinensis. Withering, p. 1054.

Habitat in palustribus, & ad ripas fossarum. Maio, Junio.

Radix valdè repens, perennis. *Folia* circiter semunciam lata, glauco-viridia, erecta, marginibus carinâque aspera, culmo breviora, basi rubra. *Culmus* pedalis, bipedalis, erectus, inæqualiter triqueter, angulis acutis asperis. *Spicæ* plerumque tres masculæ, totidem foemineæ. *Spicæ* masculæ terminales, approximatae, triquetrae, angulis obtusiusculis, oblongæ, obtusæ; squamis fuscis, nervo dorsali viridi, oblongis, obtusis. *Spicæ* foemineæ oblongæ, sæpiùs obtusiusculæ (sed variant obtusæ & acutæ pro præsentia aut absentia florum masculorum terminalium; ubi enim hi adsunt, acutæ evadunt), erectæ, inferior una aut altera breviter pedunculata, floribus arctim imbricatis: squamæ lanceolatae, valdè acutæ, fuscae, nervo dorsali viridi, capsulâ sæpè longiores. Ad omnem spicam foemineam bractea foliacea, inferior una aut altera culmo longior, basi pedunculum brevissimè amplexens; superiores aut culmum æquantes, aut paulò breviores; basi rariùs auriculatae. *Capsulae* suboctofariam imbricatae, nervosæ, ovato-lanceolatae, acutiusculæ, apice ante maturitatem integro, demum denticulis duobus brevissimis conspiciendo. *Filamenta* ut in cæteris. *Stylus* stigmatibus tribus.

This plant, which is so common with us, does not appear to have been noticed by *Linnaeus*. It is often very variable in its
5 appear-

appearance, and comes so near *riparia*, that it is not to be separated from it without a little close attention. The scales of the male spike will afford a constant character: they are always more or less blunt in this species, and very acute in *riparia*. Its capsules are either not at all, or very slightly divided at the summit, but not rostrated or furcated. From this circumstance I am inclined to add the synonym of *Micheli*, t. 32. f. 6. to *riparia*—never having observed the capsules of *paludosa* half so deeply divided.

43. CAREX ACUTA.

C. digyna, spicis filiformibus; foemineis inflorescentibus nutantibus: fructiferis erectis, capsulis acutiusculis apice indiviso.

Uvedale, Herb. Rayn. vol. 12. p. 61. n. 1.

Carex acuta, Var. β . *Fl. Suecica*, n. 857.

Carex gracilis. *Flora Londin.*—& *Witbering*, 1053.

Maio.

Radix perennis, repens. *Folia* angusta, amœnè viridia, erecta, apicibus pendulis, marginibus carinâque asperis, culmo breviora. *Culmus* altitudine mirè variat, pro solo & situ, trientalis, pedalis, bipedalis & ultra, triqueter, angulis acutissimis, asperis, sub inflorescentiâ sæpiùs cernuus. *Spicæ* masculæ duæ, rarò tres; foemineæ tres; omnes filiformes, tenues. *Spicæ* masculæ rectiusculæ, 1—3 unciales, squamis oblongis, obtusis, nigris, nervo dorsali viridi, inferiores breviores. *Spicæ* foemineæ subsessiles (est ubi inferior una aut altera breviter pedunculata), sub inflorescentiâ nutantes s. recurvæ, maturiores erectæ, floribus terminalibus sæpè masculis, &

inde acutæ. Squamæ oblongæ, acutæ, nigræ, nervo dorsali viridi, capsulâ paulò breviores. Ad omnem spicam fœmineam bractea foliacea, sessilis, basi sæpè auriculata, inferior culmo paulò longior, superiores aut æquantes aut breviores. *Capsulæ* sub-octofariam imbricatæ, ovatæ, acutiusculæ, compressæ, apice indiviso, clauso, arctim imbricatæ. *Filamenta* tria, antheris linearibus flavis. *Stylus* stigmatibus duobus.

Whatever were the other variety of *C. acuta*, mentioned in the several writings of *Linnaeus*, we are quite sure that this was one, for it is now in Dr. *Smith*'s herbarium, so named by *Linnaeus* himself. Unfortunately the other is not preserved: however I can scarcely have a doubt but it was *C. stricta*, that being the only one which I know of, which bears any resemblance to *Micheli*'s figure, t. 32. f. 12. I would not however wish to appear to be positive upon this head, as there is not that exact resemblance in the figure, which, after the commendation bestowed upon it by *Linnaeus*, we have a right to expect.

The slenderness of the habit of this plant in all its parts, its filiform spikes, pendulous when in flower, its having the pistillum with two styles, and the capsules of a compressed form or flattish, and undivided at the summit, keep it evidently distinct from all others. I have never seen it less than three or four inches high (and that only in dry starved land), and therefore state it as such.

Mr. *Curtis*, Dr. *Stokes*, and Mr. *Woodward*, all shewed good judgment in long ago suspecting this to be the *C. acuta* of *Linnaeus*. I derive my information only from seeing the plant since in the Linnean herbarium. I do not therefore take any merit to myself, as being wiser than those respectable gentlemen, but only deem myself more fortunate in

in my opportunity. *Linnaeus* evidently confounded two species under the name *acuta*. As *Michelius*'s figure was said by *Linnaeus* to be an exact likeness of his first variety, and as there was no figure quoted to his second, Mr. *Curtis*, unable to reconcile this plant to *Michelius*'s figure, judged it to be a distinct species, (who would not have done the same?) and called it *gracilis* accordingly.

44. CAREX VESICARIA.

C. spicis masculis linearibus; foemineis oblongis patentibus, capsulis inflatis oblongis rostrato-acuminatis patentibus.

Buddle, Hort. Sic. p. 29. n. 2.

Gramen cyperoides majus præcox, spicis turgidis teretibus flavescens. *Hist. Ox. III. 242. f. 8. t. 12 f. 6.*

Fl. Suecica, n. 856. Pollich. n. 895. Var. β. Leers, t. 16. f. 2. III.

C. inflata. Fl. Angl. 412. Fl. Scot. 567. Withering, p. 1057. Fl. Dan. 647.

Habitat in palustribus. Maio.

Radix repens, perennis. *Folia* pallidè virentia, culmum sub inflorescentiâ superantia, marginibus carinâque asperis, angusta. *Culmus* bipedalis, erectus, triqueter, angulis acutissimis asperis. *Spicæ* circiter tres masculæ, totidem foemineæ. *Spicæ* masculæ terminales, erectæ, superior 1—2 uncialis, cæteræ breviores, lineares, sub-triquetræ; squamis oblongis, obtusiusculis, flavis, marginibus apicem versus albidis, nervo dorsali viridi, obsoletiusculo. *Spicæ* foemineæ oblongæ, pedunculatæ (inferior pedunculo fatis longo, superiores brevioribus), 1—2 unciales, erectiusculæ; f. sub-patentes.

patentes. Squamæ lanceolatæ, angustæ, acutissimæ, pallidæ, sub inflorescentiâ capsulâ ferè duplo longiores, demum sub maturescentiâ iisdem ferè duplo breviores. Ad omnem spicam foemineam bractea foliacea, sessilis, culmo longior. Bractea tenuis spicas masculas etiam sæpiùs subtendit; hæc culmo plerumque brevior.—*Capsulæ* laxiusculè dispositæ, patentes, glabræ, flavescentes, nervosæ, ovato-oblongæ, acuminatæ, & quasi rostratæ, ore bifido. *Filamenta* ut in cæteris. *Stylus* stigmatibus tribus.

Obs. Capsulam *C. depauperatæ* refert, at spicis foemineis oblongis multifloris, & masculis pluribus distinctissima.

Linnaeus failed no where so much as in describing his *C. vesicaria*. He makes this his first variety, *C. sylvatica* his second, and *C. ampullacea* his third. Amidst so much confusion, it was scarcely possible to find any union of opinion amongst the several authors who afterwards treated of the same subject. It was plainly to be seen that they were distinct species—the difficulty lay in determining which was the original, and which the variety. Hence Mr. *Hudson* (to whom we must all be ever indebted, as being the first author of a Linnean arrangement of the British plants), and Mr. *Lightfoot*, judged *ampullacea* to be the original, and under that impression named this *inflata*. We are at length happily corrected as to these doubts by the herbarium of *Linnaeus*, wherein this plant is named *vesicaria*. Its yellow hue, narrow short scales, and inflated smooth conic capsules, point it out beyond all danger of mistake.

Scheuchzer gives a long description of this plant, p. 470.

45. *CAREX AMPULLACEA*. 186

C. spicis filiformibus; masculis tenuioribus; foemineis teretibus erectis, capsulis inflatis globosis aristato-rostratis divaricatis.

Buddle, Hort. Sic. p. 29. n. 1.

Gramen cyperoides medium angustifolium, spicis teretibus erectis flavescentibus. *Morif. Hist. Oxon.* III. 242. f. 8. t. 12. f. 8.

Carex vesicaria. *Fl. Angl.* 413. *Fl. Scot.* 566. *Pollich.* n. 895.

Var. α .

Carex rostrata. *Withering,* p. 1059.

Habitat in palustribus aquosis. Maio.

Radix valdè repens, perennis. *Folia* glauca, erecta, angusta, culmo longiora, marginibus carinâque magnâ ex parte aspera.—*Culmus* pedalis, bipedalis, erectus, triqueter, angulis acutis, summum versus asperis, sæpiùs autem infra spicam inferiorem glabris. *Spicæ* duæ aut tres masculæ, totidem foemineæ. *Spicæ* masculæ ex lineari filiformes; summa sæpiùs modicè incurva, uncialis etiam aliquando biuncialis, cæteræ breviores—*Squamæ* oblongæ, acutiusculæ (variant etiam obtusæ), flavescentes, nervo dorsali viridi, margine tenero albo. *Spicæ* foemineæ cylindricæ, unciales, biunciales, erectæ, pedunculatæ, pedunculis brevibus, inferiori longiore. *Squamæ* lanceolatæ, acutæ, flavescentes, margine pallido, nervo dorsali viridi, capsulâ ferè duplo breviores, interdum præ morbo quodam fortasse, æquales. Ad omnem spicam, vel masculam vel foemineam, bractea foliacea, angusta, erecta; superiores culmo breviores, una aut altera inferior multo longior, omnes sessiles. *Capsulæ* arctim octofariam imbricatæ, inflatæ, globosæ, aristato-âcuminatæ,

natae f. rostratae, divaricatae, ore bidenticulato, flavescentes, nervosae.—*Filamenta* ut in cæteris—*Stylus* stigmatibus tribus.

Obs. Folia radicalia quæ culmi basin obvestiunt vaginâ hinc membranaceâ, quæ mox in filamenta reticulatim connexa disrumpitur, uti in *C. strictâ* accidit.

As *Linnaeus* has distinguished other plants which have their seed-vessels shaped somewhat like this, by the trivial name of *ampullaceus*, I have adopted that appellation, as being more expressive than *rostrata*, which is a term common to many, viz. *Pseudo-cyperus*, *depauperata*, *sylvatica*, *vesicaria*, &c. &c. Besides we have the authority of *Haller* for this name, who had first described it, *capsulis ampullatis rostratis*.

This species is not common near *London*; although, from the different authors which I have cited, it appears to be an inhabitant of many parts of this island. It is to be met with plentifully at Virginia water. I do not know how to add *Leers's* figure 16. 2. n. 2. because he describes the female spikes pendulous—a circumstance I do not remember ever to have seen.

46. CAREX HIRTA.

C. pilosa, spicis omnibus oblongis; foemineis remotis vaginatis: vaginis hinc lanato-villosis, capsulis hirtis.

Buddle, Hort. Sic. p. 30. n. 1.

Gramen cyperoides polytachion lanuginosum. *Mor. Hist. Ox.* III. 243. f. 8. t. 12. f. 10.

Flor. Suec. 858. *Leers*, t. 16. f. 3. *Fl. Angl.* 414. *Fl. Scot.* 568.

Pellich. n. 897. *Fl. Dan.* 379.

Habitat

Habitat in pratis & pascuis humidis, in aquosis & palustribus.
Maio, Junio.

Radix valdè repens, perennis. *Folia* ferè semunciam lata, villosa, ad oras carinasque hispida, culmo sub-breviora. *Culmus* erectus, triqueter, angulis acutissimis, asperis. *Spicæ* duæ masculæ, tres foemineæ—*Spicæ* masculæ oblongæ, sub-unciales, erectæ; squamis ovatis, fuscis, margine albo, nervo dorsali viridi, pilosis, obtusis, & ex nervo prominenti brevissimè mucronatis. *Spicæ* foemineæ sæpiùs valdè remotæ, oblongæ, erectæ, inferiores longiùs pedunculatæ; squamis villosis, ovatis, longiùs mucronato-acuminatis, margine albido, nervo dorsali viridi. Ad omnem spicam foemineam bractea foliacea, quæ ad spicas inferiores ferè dimidium pedunculi occupat, vaginâ hinc lanato-villosâ.—Porro bractea una aut altera inferior culmum sæpiùs superat. *Capsulæ* laxiusculè dispositæ, ovatæ, acutæ, hinc planæ, illinc convexæ, hirtæ, sub-rostratæ, rostro bifido, squamis paulò longiores. *Filamenta* tria, antheris fordidiusculè flavis. *Stylus* stigmatibus tribus.

The thick down which covers the leaves, and particularly the vaginæ and capsules of this species, keeps it most manifestly distinct from all others.

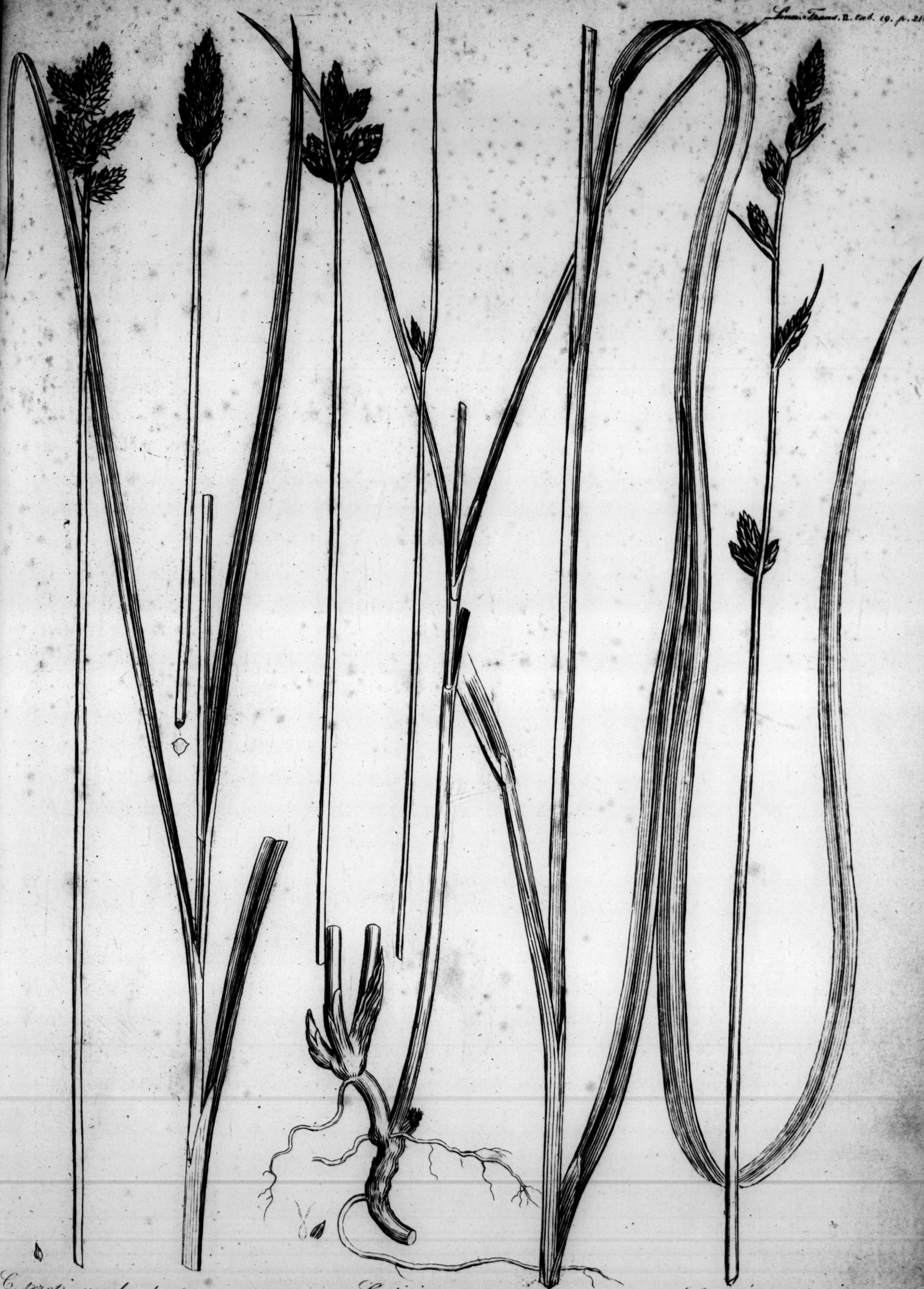
I have specimens of a *Carex*, given me by Mr. *Lightfoot*, which he informed me he met with in Scotland; it is an androgynous species, and nearly related to *axillaris*, if not the very same. The terminal spike is for the most part, but not altogether, male; a few female flowers appearing at the base. The spikes are sessile in the axillæ of slender bractæ, which are longer than

the culm; neither are they, except the lowermost, remote from each other. I do not observe any male flowers in the axillary spikes. The scales are oblong and acute, with a strong nerve on the back, which forms an acute point. The capsules are oblong and acute, and slightly bifid at the point, and do not appear to be quite so long as the scales. The spikes are all solitary.

It is distinct from *remota* by its bifid capsule.—It seems different from *axillaris* by all the spikes being solitary: but this last circumstance has raised a doubt in my mind, whether the specific character which I have given *axillaris*, be just: in particular, it prevented me from calling it *aggregata*, under which title my very skilful and accurate friend and fellow-labourer, Mr. Curtis, has spoken of it. As he has not yet published his observations, I take the advantage of consulting my fears, viz. that in bleak and barren exposures it produces its spikes solitary and not aggregate; and give it the name of *axillaris*, a name by which possibly it was known originally to *Linnaeus*, though, perhaps afterwards thinking it the same as *remota*, he rejected it as a distinct species.

My specimens are too small and too much damaged to enable me to speak, with certainty, whether it be *axillaris* or not. They are specimens of the whole plant from the crown of the roots, but not of the root itself: they appear to be from four to six inches high.

I have thus the honour of laying before the Linnean Society, my observations upon the British species of the genus *Carex*. I have purposely gone no farther into minuteness of investigation than appeared to be necessary to a sufficient knowledge of the objects themselves. I am aware, however, that the more minutely objects
are



3. *C. teretiuscula*. p. 163.

2. *C. divisa*. p. 157.

1. *C. acicularis*. p. 151.





6. *C. fulva*. p. 177.
C. distans Fl. den
1049

5. *C. filiformis*. p. 172.

4. *C. strigosa*. p. 169.
Carex leptostachya Lin. supp.





9. *C. stricta*. p. 196.

caespitosa. p. 196.

7. *C. extensa*. p. 176.



Linn. Trans. II. tab. 22. p. 210.



10. C. rigida. p. 193.



are examined, the more striking are their differences. Still, however, much is due to the consideration of practical study—He is the best mechanic, who produces the greatest effect, by the least given power: and thus, in a study like ours, he who discriminates most plainly, be the plainness simple as it may be, discriminates most laudably and satisfactorily.

There are four points of some importance to the completing of the arrangement of the *Carices*, which I have scarcely touched upon, viz. the defining with exactness the true limits of the generic character—the settling of the synonyma—the collecting and settling of the essential differences of the foreign species—and the drawing out microscopic descriptions of the parts of fructification. My object is attained, if I have contributed at all to the knowledge of those of our own country, and that by means open to easy observation.

Before I conclude, I must beg leave to return my particular thanks to Dr. *Smith* for the opportunities he has given me of consulting the Linnean Herbarium; and especially to Sir *Joseph Banks*, whose matchless library, and most extensive collections, so liberally open to the perusal of all real lovers of Natural History, were of most essential service to me in the execution of this Tract.

XVII. On Genera and Species of Plants which occur twice or three times, under different Names, in Professor Gmelin's Edition of Linnæus's *Systema Naturæ*. By Jonas Dryander, M. A. Libr. R. S. and F. L. S.

Read July 3, and October 2, 1792.

Page 5. **A** MOMUM CURCUMA of Jacquin is the same as *Curcuma longa*, page 8. so far as Linné by that name meant the officinal *Curcuma*, and certainly the same as the figure of Regnault, which the Editor quotes for *Curcuma longa*, though that figure is not very good; nor does it differ from the *Curcuma longa* of Koenig, in Retzii Obs. Bot. 3. page 72, the flowers of which, sent by Koenig, preserved in spirits, I have compared with Jacquin's description and figure, and found them to agree.

This plant does not agree with the generic character which Linné has given of *Curcuma* in Musa Cliffort. page 15, from thence copied in the different editions of his Genera Plantarum; but that character was evidently drawn up from his *Curcuma rotunda*, the *Manja-kua* of the *Hortus Malabaricus*, a plant unknown to me, but which, to judge from Rheede's figure, is very different in fructification from the officinal *Curcuma*. Linné has no doubt been led into this mistake by the assertion in *Hortus Malabaricus*, that

the flower of *Manjella-kua*, or the officinal *Curcuma*, is like that of *Manja-kua*, and by the figure of a single flower of the natural size given by Hermann with his reduced figure of the officinal *Curcuma*. This flower is exactly like that of *Manja-kua* in the *Hortus Malabaricus*, but cannot be copied from thence, as Hermann's book was published before the 11th volume of that work; I can no other-wise account for this similarity, than by supposing that Hermann had seen the drawing before the publication. The reduced figure of the whole plant, given by Hermann, is also erroneous, representing the scapus at a distance from the leaves; whereas it appears by the accounts of the *Hortus Malabaricus*, Rumphius, Koenig, and Jacquin, that the scapus comes out between the leaves.

Page 6. *Amomum spurium*, Zinziber spurium of Koenig, is the same as *Amomum zerumbet*, p. 5, as may easily be seen by comparing Koenig's description with Murray's and Jacquin's figures and descriptions. There is an error of the press in the quotation from Koenig, which should be, p. 60 instead of 59: in the latter page is found Koenig's *Amomum Cardamomum*, which the Editor has passed over, though it is a different species from Linné's *Amomum Cardamomum*; it is mentioned by Thunberg in his *Flora Japonica*, p. 15, under the name of *Amomum Cardamomum javanicum*.

Page 7. *Alpinia occidentalis* of Swartz, and p. 8. *Alpinia jamaicensis* of Gærtner, are the same.

Page 9. *Tsiana speciosa*, Banksea speciosa of Koenig, is *Costus arabicus* of Jacquin, *Costus speciosus* of Dr. Smith, in the first volume of our Society's Transactions, and *Costus arabicus* of Swartz prodr. from whence the Editor has borrowed the differentia specifica of *Costus arabicus*, in p. 7.

Page 16. *Hippuris tetraphylla* Linn. Suppl. and *Hippuris lanceolata* of Retzius, are the same.

Page 23. *Nyctanthes acuminata* of the younger Burmannus is the same as *Nerium coronarium*, p. 435, if we may judge from the synonyms quoted by Burmannus, which all belong to the *Nerium coronarium* of Jacquin.

Page 26. *Chionanthus compacta* of Swartz, and *Chionanthus caribæa* of Jacquin, are the same.

Ceranthus of Schreber is *Chionanthus incrassata* of Swartz, as the latter has informed me by letter.

Page 27. *Hebe* of Jussieu is *Veronica decussata*, p. 30. See Tableau Methodique du Chev. de la Marck, p. 45. n. 182.

Page 31. *Pæderota cærulea* of Scopoli and Linn. Suppl. is *Pæderota Bonarota* sp. pl. *Pæderota lutea* of Scopoli and Linn. Suppl. is *Pæderota Ageria* Linn. Mant.

Page 32. *Justicia spinosa* γ. *Justicia appressa* of Forskâhl is *Barleria Prionitis*, p. 959, according to Vahl, symb. 1. p. 46.

Page 33. *Justicia lanceata* of Forskâhl is the same as p. 960. *Barleria noctiflora* of Linn. Suppl. which I know both from Vahl, loc. cit. and from the comparison of a specimen from Forskâhl in Sir Joseph Banks's herbarium, with specimens sent from Koenig of the *Barleria noctiflora*.

Page 34. *Justicia viridis* of Forskâhl is *Justicia Ecboium*, p. 32. See Vahl, symb. 1. p. 2.

Page 38. *Gratiola veronicifolia* of Koenig and Retzius is the same as *Ruellia antipoda*, p. 959.

Page 40. *Utricularia inflexa* of Forskâhl is not a different species from *Utricularia stellata* of Linn. Suppl. in the opinion of Professor Vahl, symb. 1. p. 6. *Fagelia flavicans* is *Calceolaria pinnata*, p. 39.

Page 49. *Thouinia nutans*, Linn. Suppl. is *Chionanthus zeylanica*, p. 26*.

* Page 50. *Pentaglossum linifolium* of Forskâhl is already in Reichard's edition of the Systema Plantarum, given as a synonym of *Lythrum Thymifolia*, p. 753.

Page 52. *Orchis rubra* of Jacquin is *Orchis papilionacea* Linn.

Page 54. *Orchis filicornis*, and p. 58. *Ophrys patens*, are the same.

Page 56. *Satyrium elatum* of Swartz, and p. 59. *Serapias Neottia*, *Neottia minor* of Jacquin, are the same: the Editor also quotes the same figure of Plumier for both*.

Page 76. *Anthoxanthum paniculatum*, *Poa Gerardi*, p. 179, and *Festuca spadicea*, p. 186, are the same. See Dr. Smith's paper on this grass, in the first volume of our Society's Transactions.

Page 77. *Piper latifolium*, and, p. 78, *Piper methysticum*, is the same species of Linn. Suppl. taken up twice with the same differentia specifica, but different trivial names. Young Linné had, in the Supplement, described the *Piper latifolium* of Solander and Forster, and mistaking it for the species from which the intoxicating liquor Ava is made, he applied to it the trivial name of *methysticum*, which Forster had given to the latter one; but on his coming to England, he was informed of his mistake, and desired Mr. Ehrhart, who had the direction of the printing of the Supplement, to rectify it, which was done by inserting in the last page of the book a correction, to read *latifolium* for *methysticum*.

Page 79. *Piper stellatum* of Swartz is, I believe, the same as *Piper verticillatum*, p. 78; at least I can see no other difference, than in the length of the spikes, between Browne's specimen of the latter in Linné's herbarium, and a specimen from Jamaica in Sir Joseph Banks's herbarium, which D. Swartz has marked as his *P. stellatum*.

Page 97. *Ficus vasta* of Forkâhl is *Ficus benghalensis*, p. 96. See Vahl, symb. 1. p. 82.

Page 71. *Kofaria* of Forkâhl is the same genus as *Dorstenia*, p. 265. See Lamarck, in Act. Soc. Hist. Nat. Paris. p. 85. It is very improperly quoted in Linn. Suppl. as a synonym for *Ocymum capitellatum*.

Page 105. *Loeflingia indica* of Koenig and Retzius has *Pharnaceum depressum* of Linn. Mant. for synonym, but still occurs again, p. 506, under the latter name.

Page 106. *Alternanthera* of Forskâhl, is *Illecebrum sessile*, p. 427. See Vahl, symb. 1. p. 22.

Page 108. *Ixia Lapeirousia*, La Peyrousia compressa of Pourret, is the same as p. 111. *Gladiolus anceps* of Thunberg, and Linn. Suppl.

Page 117. *Moræa fugax* of Jacquin is the same as, p. 116, *Iris edulis* of Thunberg.

Page 119. *Aristea cyanea* of Hort. Kew. and, p. 117, *Moræa africana* of Thunberg, *Ixia africana*, Spec. plant. are the same.

Page 125. *Scirpus fistulosus* of Forskâhl is *Scirpus articulatus*, p. 124. See Vahl, symb. 1. p. 8.

Page 126. *Scirpus niloticus*, *Scirpus bifumbellatus* of Forskâhl, is *Scirpus dichotomus*, p. 128. See Vahl, symb. 1. p. 8. Professor Vahl also joins with them the *Scirpus annuus* of Allioni, which the Editor, by a strange mistake, has arranged in the first division of the genus, p. 124, though it has umbella decomposita.

Page 128. *Scirpus cyperoides* is referred by the Editor himself, in p. 122, to *Kyllinga sumatrensis*, as a synonym; and here he quotes, as figure of it, Rottboell, tab. 4. fig. 2. which is *Kyllinga umbellata*.

Page 129. *Cyperus niloticus* of Forskâhl is, in the opinion of Professor Vahl, symb. 1. p. 7. not a different species from *Cyperus articulatus*.

Page 131. *Cyperus ferrugineus* of Forskâhl is *Cyperus fuscus*, p. 133. See Vahl, symb. 1. p. 8.

Page 136. *Schoenus cyperoides* of Koenig and Retzius is the same as *Cyperus triflorus*, p. 133. In p. 137. is a different *Schoenus cyperoides*, from Swartz.

Schoenus

Schoenus odoratus is the same as *Kyllinga triceps*, p. 122. See Rottb. descr. et ic. p. 14.

Page 143. *Carex pendula* of Hudson and Curtis is the same as, p. 145. *Carex Agastachys* of Ehrhart.

Page 151. *Axyris ceratoides* is the same as, p. 274. *Kraschenninikofia latens*, *Kraschenninikouia Ceratoides* of Güldenstädt; and p. 424. *Achyranthes papposa* of Forskâhl is also the same; see Vahl, fymb. 1. p. 76.

Page 152. *Saccharum Koenigii* of Retzius, *Saccharum diandrum* of Koenig, is, I believe, the same as *Lagurus cylindricus*, p. 194.

Page 153. *Phalaris aspera* of Retzius is probably the same as, p. 167. *Pbleum paniculatum* of Hudson.

Page 154. *Phalaris disticha* of Forskâhl is, by Professor Vahl, fymb. 1. p. 9. referred to *Agrostis pungens*, Schreb. gram. 2. p. 46. tab. 27. f. 3.; and in comparing this figure with a specimen in Sir Joseph Banks's herbarium, from Forskâhl, and another from Abbé Pourret, of his *Agrostis pungens*, which the Editor has taken up, p. 171. from Lamarck, I see no reason to doubt the identity of these three plants.

Phalaris velutina of Forskâhl is *Panicum sanguinale*, p. 159. See Vahl, fymb. 1. p. 8.

Phalaris setacea of Forskâhl is *Panicum polystachyon*, p. 156. See Vahl, fymb. 2. p. 18.

Page 158. *Panicum tetraetichon* of Forskâhl is *Panicum colonum*, p. 157. See Vahl, fymb. 1. p. 9.

Panicum fluitans of Koenig and Retzius, and *Panicum geminatum* of Forskâhl, are the same. See Vahl, fymb. 1. p. 8.

Page 159. *Panicum compressum* of Forskâhl is *Cynosurus indicus*, p. 185. See Vahl, fymb. 2. p. 21.

Page 173. *Holcus exiguus* of Forskâhl is *Holcus halepensis*. See Vahl, fymb. 1. p. 81.

Holcus Durra of Forskâhl (misprinted *Duna*) is *Holcus Sorghum* (misprinted *Soryhum*). See Vahl, symb. 1. p. 80.

* Page 182. *Poa cynosuroides* of Retzius, *Poa madraensis* of Koenig, is the same as, p. 183. *Uniola bipinnata*.

Poa multiflora of Forskâhl is *Briza Eragrostis*, p. 183. See Vahl, symb. 2. p. 20.

Page 183. *Poa ficula* of Jacquin's collect. et ic. *Briza cynosuroides* of Scopoli, and, p. 185. *Cynosurus ficulus* of Jacquin's obs. bot. are the same; and the Editor quotes the same figure for the first and the last. It is the *Triticum unioloïdes* of Hort. Kew. and *Triticum brizoides* of Lamarck, encycl. 2. p. 561.

Page 185. *Cynosurus lagopoides* of Burmannus should, according to the synonym of Plukenet, be *Illecebrum Monsoniæ*, p. 426; but as I cannot suppose that any botanist could mistake an *Illecebrum* for a grass, I must only conclude that a wrong figure has been quoted.

Page 187. *Festuca dichotoma*, and, p. 188. *Festuca lanceolata* of Forskâhl, are the same as *Triticum maritimum*, p. 200. See Vahl, symb. 2. p. 26.

Page 189. *Bromus asper* of Linn. Suppl. is the same as, p. 190. *Bromus montanus* of Pollich, and *Bromus hirsutus* of Curtis, whose differentia specifica the Editor has copied, without quoting him, but referring to Hudf. Angl. 51, where it is true that this plant occurs, but under the name of *Br. nemoralis*, and with a different specific description. To make the confusion still greater, Curtis's figure is quoted under *Br. ramosus* of Linn. Mant. which is quite a different plant, and not found in England.

Page 190. *Bromus villosus* of Forskâhl is *Bromus madritensis*, p. 188. See Vahl, symb. 2. p. 23.

* Page 176. *Melica Lobelii* of Villars, and *Melica uniflora* of Retzius and Curtis, are the same. See Lamarck in Act. Soc. Hist. Nat. Paris. 1. p. 85.

Page 191. *Stipa arguens* is the same as *Anthistiria ciliata*, p. 194.

Page 196. *Aristida lanata* of Forkâhl is *Aristida plumosa*, p. 195.
See Vahl, symb. 1. p. 11.

Aristida paniculata of Forkâhl is *Aristida adscensionis*, p. 195. See Vahl, symb. 2. p. 25.

Page 197. *Rotboellia corymbosa* of Linn. Suppl. *Ægilops exaltata* of Linn. Mant. is the same as *Rotboellia punctata* of Retzius.

Page 198. *Secale prostratum* of Pallas is the same as, p. 200. *Triticum prostratum* of Linn. Suppl.

Page 199. *Hordeum imrinum* of Forkâhl, and *Hordeum geniculatum* of Allioni, are the same. See Vahl, symb. 2. p. 25.

Hordeum secalinum of Schreber, and *Hordeum maritimum* of Müller, are the same, in the opinion of Professor Retzius, Fl. Scandin. n. 144.

Page 200. *Triticum bromoides* of Wiggers is *Bromus pinnatus*, p. 190.

Page 203. *Phyllanthus speciosus* of Jacquin is the same as *Xylophylla latifolia*, p. 499.

Page 206. *Eriocaulon amplexicaule* of Rottböll is the same as, p. 570. *Tonina fluviatilis* of Aublet.

Page 223. *Protea bruniades* of Linn. Suppl. and *Protea corymbosa* of Thunberg, are the same.

Page 227. *Lidbeckia capensis*, *Lidbeckia pectinata* of Bergius, is *Cotula stricta*, p. 1250.

Page 230. *Scabiosa altissima* of Jacquin, which the Editor has taken up as variety β . of *Scabiosa africana*, is *Scabiosa indurata*, Linn. Mant.

Page 231. *Crinita capensis* of Houttuyn is the same as, p. 244. *Pavetta caffra*, Linn. Suppl.

Page 232. *Hedyotis americana* of Jacquin is the same as *Hedyotis rupestris*, which the Editor has borrowed from Swartz, prodr. 29.

without quoting him, and without attending to the reference to Jacquin.

Page 233. *Scabrita scabra* is certainly the same as *Nyctanthes Arbor tristis*, p. 23.

Page 235. *Asperula calabrica* Linn. Suppl. and, p. 243. *Pavetta fœtidissima* of Cyrillo, are the same.

Page 243. *Ixora alternifolia* of Jacquin remains here, though the Editor has very properly quoted Jacquin's figure under *Cestrum vespertinum*, p. 388.

Page 250. *Buddleja globosa* of Hope is the same as *Buddleja capitata* of Jacquin.

Page 254. *Scoparia ternata* of Forskâhl is *Scoparia dulcis*, according to Vahl, symb. 1. p. 12.

Page 256. *Cissus arborea* of Forskâhl is *Salvadora persica*, p. 280. See Vahl, symb. 1. p. 12. *Rivina paniculata*, p. 278. is also the same; it has remained in all the editions of the *Systema Vegetabilium* and *Systema Naturæ* since the tenth edition, though it is referred to *Salvadora persica* in *Spec. plant.* ed. 2. p. 178. *Embelia indica*, p. 280. must also be considered as the same, as the Editor has taken the character of it from Retzius, whose *Embelia Grossularia* is the *Salvadora persica*. *Embelia Ribes* of Burm. ind. 62. *Ribesoides* Linn. Fl. Zeyl. 403, is a very different plant; it is by Gærtner, sem. 1. p. 189, referred to the genus of *Antidesma*, from its drupa nuce scrobiculata.

Page 259. *Funghansia faginea* is the same as, p. 247. *Relhamia* (read *Relhania*) *faginea*, *Curtisia faginea* of Hort. Kew.

Page 260. *Sceura marina* of Forskâhl is *Avicennia tomentosa*, p. 963. See Vahl, symb. 1. p. 47.

Sirium myrtifolium, and, p. 276. *Santalum album*, are the same.

Page 261. *Ludwigia repens* of Swartz is *Isnardia palustris*, p. 265.

Page 262. *Azima nova* is, I suppose, meant for *Azima tetracantha* of Lamarck, and then it is the same as, p. 254. *Monetia barlerioides* of L'Heritier. *Azima diacantha* of Lamarck is only taken from Plukenet's figure, and consequently doubtful.

Page 263. *Oldenlandia repens*, and, p. 370. *Dentella repens* of Forster, are the same.

Oldenlandia tenuifolia is the same as *Hedyotis herbacea*, p. 232.

Page 269. *Urtica elongata*, *Urtica Japonica* of Linn. Suppl. is probably the same as *Urtica spicata* of Thunb. Japon. at least I cannot find there any other species it can be; and it is natural to suppose that a plant from Japan, which young Linné had received from Thunberg, must be found in the Flora Japonica of the latter.

Page 272. *Mafrunea guianensis* of Aublet is *Ægopricon betulinum*, p. 18. See Smith ic. plant. 42.

Page 275. *Moscharia* of Forstkâhl is *Teucrium Iva*, p. 893. See Vahl, symb. 1. p. 40.

Nigrina spicata of Thunberg is certainly the same as, p. 280. *Chloranthus inconspicuus* of Swartz. The discovery of the identity of them was made by Professor Swartz himself, on seeing the *Nigrina* in Chevalier Thunberg's herbarium.

Page 279. *Nacibea coccinea* of Aublet is certainly the same genus as *Manettia*, p. 277, which differs only from *Cinchona* in the number of the foliola calycina being double to that of the division of the corolla and of the stamina. *Nacibea alba*, having the number of the foliola calycina equal to the divisions of the corolla and the stamina, may be more properly referred to the genus *Cinchona*, as the mere difference in number cannot be sufficient to separate genera.

Page 283. *Morus tinctoria*, and *Morus Xanthoxylum*, are the same.

Page 284. *Laurembergia capensis*, *Laurembergia repens* of Bergius, is the same as *Serpicula repens*, p. 276.

Page 286. *Gomozia granadensis* is the same as *Nertera depressa*, p. 282. See Smith ic. plant. 28.

Page 314. *Heliotropium coromandelianum* of Koenig, and *Heliotropium ovalifolium* of Forskâhl, are the same. See Vahl, symb. 1. p. 13.

Page 318. *Anchusa tuberculata* of Forskâhl is *Lithospermum orientale*, p. 316. See Vahl, symb. 1. p. 14.

Anchusa flava of Forskâhl is *Asperugo ægyptiaca*, p. 321. See Vahl, symb. 1. p. 14.

Page 324. *Tournefortia humilis* is the same as *Heliotropium fruticosum*, p. 314.

Page 339. *Endrachium madagascariense* is the same as *Smithia Thouinia*, p. 388. *Thouinia spectabilis* of Smith. See Smith ic. plant. fasc. 2. p. 6.

Convolvulus Hermanniae of L'Heritier, and, p. 341, *Convolvulus crenatus* of Jacquin, are the same.

Page 340. *Convolvulus nervosus* of Burmannus is the same as, p. 341, *Convolvulus speciosus* of Linn. Suppl.

Page 345. *Ipomoea palmata* of Forskâhl is *Convolvulus Cairicus*, p. 342. See Vahl, symb. 1. p. 15.

Ipomoea biloba of Forskâhl is *Convolvulus Pes capræ*, p. 344, as I know from a specimen of Forskâhl's in Sir Joseph Banks's herbarium.

Ipomoea aquatica of Forskâhl is *Convolvulus repens*, p. 343. See Vahl, symb. 1. p. 17.

Page 354. *Röella reticulata* has no other authority for its existence than Petiver's figure, and his calling it a Campanula; but on comparing this figure with *Gorteria ciliaris*, it is clear that it represents that plant without flowers.

Page 356. *Lobelia surinamensis*, and *Lobelia lævigata*, are the same.

Lobelia

Lobelia bulbosa, *Lobelia Cyphia*, p. 357, *Lobelia bulbosa* Linn. Suppl. and, p. 370. *Cyphium capense*, *Cyphia bulbosa* of Bergius, are the same; which I could easily tell, even if I did not know the plant, as Bergius quotes Linn. sp. pl. and the younger Linné quotes Bergius, though he has forgot to refer to his father's writings. In the figure of Burmannus, quoted for *Lobelia bulbosa*, the Editor has copied the error of press in the species plantarum, (fig. 1. instead of 2.) without attending that he in the following page refers the same figure to *L. coronopifolia*, which it is.

Page 357. *Lobelia comosa* remains here as a species, though it is taken up in the foregoing page as a variety β . of *Lobelia triquetra*.

Page 358. *Lightfootia oxycoccoides* and *subulata* of L'Heritier are here joined with the genus of *Lobelia*, from which they are very distinct; and again, in p. 826, they are taken up under Swartz's genus of *Lightfootia*, to which they have not the smallest affinity.

Page 359. *Rondeletia biflora* of Rottböll is the same as, p. 334. *Viresta biflora* of Linn. Suppl.

Page 366. *Hamellia ventricosa* of Swartz, and *Hamellia grandiflora* of L'Heritier, are the same.

Page 368. *Lonicera media* of Murray, known in the English gardens under the name of *L. glauca*, is the *Lonicera dioica* of Linné, as appears from his herbarium.

Page 371. *Morinda muscosa* of Jacquin remains here in the genus *Morinda*, though the Editor has taken it up, p. 372, as *Cephaelis muscosa* from Swartz.

Page 373. *Lignonia* of Scopoli is, by his own account, *Paypayrola* of Aublet, which the Editor has taken up under that name, p. 419.

Page 382. *Physalis limensis* of Retzius, I have no doubt, from the description, of being the same as, p. 381. *Physalis prostrata* of L'Heritier; but how the latter came in the division of Perennes, I cannot tell. The first words in L'Heritier's description are: "Planta annua."

Page 385. *Solanum ægyptiacum* of Forskâhl is *Solanum nigrum* ⁊ *villosum* of Linn. according to Vahl, fymb. 2. p. 40.

Solanum memphiticum, Forsk. p. 46. n. 51. is, by Professor Vahl, loc. cit. referred to *Solanum nigrum* as a new variety *n. hirsutum*.

Solanum incanum of Forskâhl is *Solanum sanctum*, p. 386. See Vahl, fymb. 2. p. 41.

Page 387. *Strychnos potatorum* of Linn. Suppl. and *Strychnos Tetankotta* of Koenig and Retzius, are the same. Tetan-kottæ, which is probably the Tamul name of this tree, is quoted in the former place.

Page 389. *Lycium japonicum* of Thunberg, and *Lycium fœtidum* of Linn. Suppl. are the same; but more properly taken up as a distinct genus by Jussieu under the name of *Serissa*, by L'Heritier called *Buchozia*, and by Loureiro, *Dysoda*.

Lycium heterophyllum of Murray is the same as *Lycium boerhaviaefolium* of Linn. Suppl. which the Editor has taken up, p. 393, under L'Heritier's name of *Ehretia halimifolia*. By a strange error of the press, the name which ought to follow the quotation, Suppl. p. 150, is to be found in the following page, between n. 6. and n. 7.

Page 390. *Placoma pendulum*, and, p. 428. *Plocama pendulum*, is the same plant of Hort. Kew. taken up twice, with a small variation in the generic name, probably only from an error of the press.

Page 391. *Vallaris indica*, *Vallaris pergulanus* of Burmannus, is *Pergularia glabra*, p. 440.

Meisteria anonyma, Barreria of Scopoli, n. 767, (misprinted 868.) is *Poraqueiba guianensis* of Aublet; and though the Editor has taken the character essentialis, not from Scopoli, but from Aublet's generic description, he still has the same plant, in p. 331, under Aublet's name.

Page 392. *Chironia dodecandra* of Walter is meant for *C. dodecandra* of Species plant. as the trivial name is not printed in italics; and then it is *Chlora dodecandra*, p. 618.

Page 398. *Rhamnus pentaphyllus*, first published by Linné, under the name of *Rhamnus ficulus*, in the Appendix to the 3d tom. of the Systema Naturæ, 12th edition, is the Argan or Olive-tree of Morocco (see Höfts efterretninger om Marokos, p. 284): as appears from the specimen in Linné's herbarium, which has a ticket affixed with the name of Argan of Morocco, and which I have also compared with specimens in Sir Joseph Banks's herbarium from Morocco. From Clifford's herbarium, now in the possession of Sir Joseph Banks, it also appears, that the Argan was already taken up by Linné in the Hortus Cliffortianus, under the name of *Sideroxylum spinosum*, though most of the synonyms are wrong, and consequently the locus natalis, which is taken from them. The specimen in Linné's herbarium, under the name of *Sideroxylum spinosum*, is without flowers, and such that it is impossible to tell with any certainty what it is; Clifford's herbarium is therefore the only authority by which this species can be ascertained. *Rhamnus ficulus pentaphyllos* of Boccone, which is quoted as a synonym for the first, is a very different plant, having really folia quinata, and consequently not at all likely to belong to either of these genera. The specimen which Jacquin has described in his Obs. Bot. is now in Sir Joseph Banks's herbarium; but having no flowers, only fruit, it is impossible to determine it.

Page 399. The specimen in Linné's herbarium, from which the differentia specifica of *Rhamnus micranthus*, and the description in Amœn. Academ. were made, is *Boehmeria ramiflora*, p. 267; but the synonyms belong to a species of *Celtis*, taken up in Swartz's prodr. under the name of *micrantha*.

Rhamnus ellipticus of Swartz and Hort. Kew. and, p. 402, *Ceanothus reclinatus* of L'Heritier, are the same; and the Editor quotes the same figure of Browne for both.

Page 403. *Mæsa* of Forskâhl is the same genus as, p. 370. *Bæobotrys* of Forster; Forskâhl's plant is called by Vahl, symb. 1. p. 19. *Bæobotrys lanceolata*.

Page 408. *Rubentia* of Commerſon and Juffieu is the same as, p. 417. *Elæodendrum* of Jacquin.

Page 409. *Diosma unicapſularis* of Linn. Suppl. is the same as, p. 268. *Empleurum Aitoni*, *Empleurum ferrulatum* of Hort. Kew.

Diosma odoratiſſima of Montin, and *Diosma latifolia* of Linn. Suppl. are the same.

Page 418. There is no reason to ſuppoſe that *Mangifera Amba* of Forskâhl is different from *Mangifera indica*, in which Jacquin has found the ſtamina ſuch as Forskâhl deſcribes them in Amba. See ic. vol. 2. and collect. 4. p. 97.

Page 422. *Loghania* of Scopoli, n. 1076, (miſprinted 1476,) is, by his own account, *Souroubea* of Aublet, and conſequently *Ruyschia Surubea*, p. 407.

So far I had written when I received the firſt part of the firſt volume of the Tranſactions of the Society of Natural Hiſtory of Paris, in which M. Lamarck has given a memoir on this ſubject; but not having had leiſure to examine this edition thoroughly, the

the instances he gives of these duplications and triplications of genera and species, are not so many as they would have been, if he had extended his researches farther. My first intention, on perusing M. Lamarck's observations, was to leave out in this paper all the instances given by him; but, considering that our Society's Transactions may fall into the hands of many who have not so easy an opportunity of seeing the French Actes, I shall pursue my plan in the same manner as I have begun it, and have also added, in notes to the former part of this paper, three instances from M. Lamarck, which had escaped my observation.

Page 424. *Achyranthes villosa* of Forskâhl is *Illecebrum lanatum*, p. 426. See Vahl, symb. 1. p. 22.

Page 430. *Anguillaria* is the same genus as *Ardisia*, p. 394, and *Anguillaria bahamensis* and *Ardisia excelsa* are the same plant; but Dr. Gærtner has made a mistake in the trivial name, this tree being a native of the island of Madeira, and not of the Bahama Islands. *Bacca infera* given as specific difference to the *Anguillaria zeylanica* of Gærtner, by the Editor, is so ridiculous a mistake that I can no way account for it.

Page 433. *Cerbera parviflora* of Forster is the same as, p. 439. *Ochrosia borbonica*, as I learnt by the comparison of a specimen from Forster in Sir Joseph Banks's herbarium, with a specimen of Commerſon's in the possession of Mr. Viborg; but *Ochrosia maculata* of Jacquin's Icones & Collectanea is probably a different species, having lanceolate leaves, longer and narrower than those of *Cerbera parviflora*.

Page 434. *Gardenia jasminoides* of Retzius, and *Gardenia scandens* of Thunberg, are the same. M. Lamarck makes, in his memoir, an observation, that *Gardenia spinosa* and *dumetorum* are the same; and he is very right that *G. spinosa* of Linn. Suppl. is

the same as *G. dumetorum* of Koenig and Retzius; but I am inclined to believe that *G. spinosa* of Thunberg, from China, is a different species, having the calyx externally, and the germen very hairy, which both are smooth in the former.

Page 439. *Amsonia Tabernæmontana* of Walter is certainly meant for *Tabernæmontana Amsonia* of Linné, as the trivial name is printed in Roman character; and I think it highly probable that his *Amsonia ciliata* is the same as *Tabernæmontana angustifolia* Hort. Kew.

Page 441. *Cynanchum cordifolium* of Koenig and Retzius is the same as, p. 442, *Cynanchum extensum* of Jacquin.

Page 444. *Asclepias cordata* of Forskâhl is *Pergularia tomentosa*, p. 440; but the description in Linn. Mant. 53. does not belong to the same plant, as may easily be seen by comparing it with the *differentia specifica*; nor is the synonym of Burmannus properly referred to it. See Vahl, symb. 1. p. 23.

Page 445. *Asclepias repanda* is, if I am not mistaken, the same as *Asclepias crispa*.

Page 453. *Salsola monobractea* of Forskâhl, and *Salsola muricata* of Linn. Mant. are the same. See Vahl, symb. 1. p. 24.

Salsola mucronata of Forskâhl is the same as, p. 454. *Anabasis spinosissima* of Linn. Suppl. See Vahl, loc. cit.

Page 454. *Steris javana* is the same as *Nama zeylanica*, p. 457.

Page 463. *Vahlia capensis* of Thunberg is the same as *Russelia capensis* Linn. Suppl.

Page 477. *Peucedanum minus* is the same as *Pimpinella dioica*, p. 492.

Page 483. *Sium ninsi* is taken up only from Kämpfer's figure, which certainly represents *Sium Sisarum*; and it is to be supposed that the Japanese had been imposed upon by the Chinese, to take
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this for the plant which furnished the Ginfeng, as we know by the figure drawn by Father Jartoux, on the spot where this famous root is collected, that it is the root of *Panax quinquefolium*. See his figure in the tenth volume of *Lettres Edifiantes*, copied from thence in the *Philosophical Transactions*, vol. 28. tab. 5. and in *Description de la Chine par du Halde*, folio edition, vol. 2, at page 154.

Page 484. *Sison falsum* of Linn. Suppl. is the same as, p. 477. *Peucedanum redivivum* of Pallas.

Page 499. *Tamarix orientalis* of Forskâhl is the same as *Thuja aphylla*, p. 1006. See Vahl, symb. 2. p. 48.

Page 502. *Passiflora stipulata* of Aublet, is probably the same as *Passiflora glauca* of Hort. Kew. In Aublet's own herbarium is no specimen of his plant, so that it cannot be ascertained with certainty; but a specimen in Sir Joseph Banks's herbarium, collected in Cayenne by Mr. von Rohr, which I think very likely to be Aublet's plant, has stipulæ semicordatæ, as the *P. glauca* of Hort. Kew. even more rounded than the lowest stipulæ in Aublet's figure, and not semi-sagittatæ, as the upper ones in the same figure.

Page 511. *Statice aphylla* of Forskâhl is the same as *Statice pruinosa*. See Vahl, symb. 1, p. 26.

Page 515. *Schranckia quinquefaria*, Scop. introd. g. 1334, has given me more trouble than any other of the frequent mistakes of the Editor. No *Schranckia* is in Scopoli, and 1334 is an error of the press. After several fruitless attempts to find this genus, I had at last the patience to examine every genus in Scopoli which is not taken from Linné, and from this investigation I found that it could be no other genus than 1043, *Goupia* of Aublet, though the Editor has given a false character of the fruit, from misunderstanding

standing Aublet's figure. *Goupia* is before taken up, in p. 510, under Schreber's name of *Glossopetalum*.

Wisenia indica, *Visenia umbellata* of Houttuyn, is the same as, p. 1011. *Melochia odorata* of Forster and Linn. Suppl.

Page 520. *Eracissa hexagyna* of Forstkâhl, and, p. 597, *Limeum humile* of Forstkâhl, are the same as *Andrachne telephioides*, p. 504. See Vahl, symb. 2. p. 99.

Schefflera of Forster is the same genus as *Aralia*, p. 509.

Page 531. *Hepetis angustifolia* of Swartz is the same as, p. 530. *Pitcarnia bromeliæfolia* of L'Heritier.

Page 532. *Lachenalia mediana* of Jacquin, and *Lachenalia pallida* of Hort. Kew. are the same.

Page 533. *Tradescantia spathacea* of Swartz, and *Tradescantia discolor* of L'Heritier, are the same.

Page 537. *Crinum obliquum* of Linn. Suppl. is the same as, p. 538, *Timmia obliqua*, *Cyrtanthus obliquus* of Hort. Kew. And the Editor quotes the same figure of L'Heritier for both, though in the former quotation is an error of the press, 15 instead of 16. (Tab. 15. is *Amaryllis aurea*, for which it is quoted in p. 539.)

Page 538. *Crinum angustifolium* of Linn. Suppl. is the same as *Timmia angustifolia*, *Cyrtanthus angustifolius* of Hort. Kew.

Amaryllis capensis is certainly the same as *Hypoxis stellata*, p. 548.

Page 547. *Enargea marginata* of Solander and Gærtner is the same as, p. 556. *Callixene* of Commerfon and Jussieu.

Page 550. *Ornithogalum caudatum* of Jacquin is the same as *O. caudatum* of Hort. Kew. which the Editor has taken up, in p. 551, under the name of *Ornithogalum Massoni* (misprinted *Malsoni*.)

Ornithogalum flavescens and *Ornithogalum miniatum* of Jacquin seem to me to be only varieties, differing in nothing but the colour of the flowers. The differentia specifica which the Editor has given

of the former is erroneous; for longioribus must be read brevioribus.

Page 551. *Ornithogalum crenulatum* of Linn. Suppl. and *Ornithogalum unifolium* of Retzius, I take to be the same.

Page 556. *Leontice leontopetaloides* is certainly the same as, p. 767. *Tacca pinnatifida*.

Page 558. *Dracæna medeoloides* of Thunberg is the same as, p. 588. *Medeola asparagoides*.

Page 561. *Hyacinthus lanatus* is the same as, p. 560. *Argolasia* of Jussieu, or *Lanaria plumosa* of Hort. Kew.

Phormium bulbiferum of Cirillo is the same as, p. 532. *Lachenalia pendula* of Hort. Kew.

Page 562. *Aletris japonica* of Thunberg, in Nova Acta Societatis Scientiarum Upsaliensis, is the same as, p. 565. *Hemerocallis japonica* of Thunberg's Flora japonica.

Page 570. *Virola sebifera* of Aublet is before taken up, in p. 11. from Swartz prodr. under the name of *Myristica sebifera*.

Page 573. *Achras salicifolia* occurs before in p. 398, under Swartz's name of *Bumelia salicifolia*.

Page 579. *Bambus*, *Bambos* of Retzius, *Bambusa* of Schreber, is probably the same genus as, p. 580. *Nastus* of Jussieu.

Page 580. *Manfana arborea*, *Manffanas* of Sonnerat, is the same as *Rhamnus fujuba*, p. 401. See Lamarck in Act. Soc. Hist. Nat. Paris. 1. p. 83.

Page 587. *Wurmbea capensis* of Thunberg is the same as, p. 588. *Melanthium monopetalum* of Linn. Suppl.

Page 596. *Dracontium cordatum* of Aublet is the same as, p. 275. *Pothos macrophylla* of Swartz.

Page 609. *Heinzia* of Scopoli is *Coumarouna* of Auble, p. 1084. *Baryosma Tongo* of Gärtner.

Portesia ovata of Cavanilles is the same as, p. 679. *Trichilia pallida* of Swartz.

Page 610. *Trigonis tomentosa* of Jacquin, and *Cupania tomentosa* of Swartz, are the same.

Page 611. *Euphoria* of Jussieu, p. 612. *Scytalia* of Gærtner, and, p. 635, *Litchi* of Sonnerat, are the same genus; and if the Editor by *Euphoria sinensis* means the Litchi, they are all the same species; but as M. Jussieu mentions both Litchi and Longan as species of his genus of *Euphoria*, I cannot possibly guess which of the two the Editor meant. In a future edition of the *Systema Vegetabilium* we may expect this famous Chinese fruit to make a fourth genus, under Loureiro's name of *Dimocarpus*.

Molinæa of Commerçon and Jussieu is the same genus as, p. 610. *Cupania*. See Lamarck in *Act. Soc. Hist. Nat. Paris.* 1. p. 84. M. Lamarck makes in the same place an observation relative to the *Jambolifera pedunculata*, p. 613. that it is icofandrous, and not generically different from *Eugenia*. The *Jambolana* of Rumphius certainly belongs to the class Icofandria, and strictly speaking to the genus of *Calyptranthes* of Swartz; but the plant which Linné described, from Hermann's herbarium, in *Flora Zeylanica*, n. 139, under the name of *Jambolifera*, is a very different plant, noways related to the family of Myrti. Mr. Schumacher was the first who pointed out to me the true *Jambolifera pedunculata* Linn. in Sir Joseph Banks's herbarium, sent by Dr. Koenig under the name of *Myrtus cumini*, octandra monogyna, flore infero; and he informed me, that Professor Rottboell had compared this plant, sent to him by Dr. Koenig under the same name, with the specimen of *Jambolifera pedunculata* in Hermann's herbarium, now in the possession of Count Moltke, and found them to be the same. The only way I can account for this confusion is to suppose that
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in Hermann's herbarium, the tickets of Madan and Ankænda had by some accident been changed, and Linné thereby induced to give the name of Jambolifera to Ankænda, believing it to be the tree which bears the Jambolains of Acofta. Dr. Koenig again, who seems to have made out the plants in Linn. Fl. Zeylan. almost entirely by the Cingalese names, sent this plant by the name of Myrtus cumini, as the name of Ankænda is in Fl. Zeylan. ascribed to Myrtus, n. 185. (cumini); and he sent the Jambolana (Madan Cingal.) under the name of Jambolifera pedunculata. The fruit of Ankænda is described by Dr. Gärtner under the name of Cyminofma; but his first species, tab. 58. fig. a—H, cannot be the same with Dr. Koenig's, as the petals are nearly of the same length with the calyx: the other species, which Gärtner describes with petals three times the length of the calyx, may perhaps be the same as Dr. Koenig's plant, and if so, it is figured in Rheed. Mal. 5. tab. 15. which figure agrees tolerably well with Dr. Koenig's specimen in regard to flowers and leaves, and as to fruit with Gärtner, tab. 58. fig. i. For further elucidation of this genus, which has been the subject of so much confusion, I take the liberty of introducing here, from Koenig's manuscripts vol. 17. p. 189 (in Sir Joseph Banks's library), his description of the flower, made in Ceylon from the living plant.

“ *Calyx* tetraphyllus: *foliola* orbicularia, patentissima, glabra, viridia, longitudine vix basin floris æquantia: duo minora. *Petala* quatuor, lanceolata, patienti-recurvata, canaliculata, acuta, subunguiculata, viridi-albicantia, floribus Pavettæ simillima habitu & magnitudine. *Filamenta* octo, alterna receptaculo, alterna petalorum basi adnata, patientia, lanceolato-lineararia, plana, basi pilosa, petalis breviora & concolora. *Antheræ* oblongæ, versatiles. *Germen* nectario carnosum, elevato, octangulati, piloso, luteo adnatum, ovatum, tomentosum. *Stylus* erectus, glaber, staminibus brevior, viridis.

viridis. *Stigma* subcapitato-conicum, glabrum, fulculis notatum."

The four stamina, which alternate with the petals, have no doubt been taken for petals by Dr. Gærtner, who counts eight petals persistent below the fruit.

Page 614. *Amyris ambrosiaca*, and, p. 619, *Icica heptaphylla*, are the same; and the same figure of Aublet is quoted for both.

Page 615. *Bineetaria* of Forstkâhl is the same as *Mimusops Kauki* (misprinted Kanki), p. 612. See Vahl, symb. 1. p. 27.

Page 618. *Mindium* of Jussieu, and *Michauxia nova*, *Michauxia campanuloides* of L'Heritier and Hort. Kew. are the same.

Page 629. *Heymassoli* of Aublet is the same genus as *Ximenia*, p. 615. See Juss. gen. 260, and Lamarck in Aët. Soc. Hist. Nat. Paris, 1. p. 84. *Heymassoli spinosa* is probably not different from *Ximenia americana*; the specimen in Aublet's own herbarium, now in the possession of Sir Joseph Banks, is so bad, that nothing can be inferred from it; but in a better specimen, collected by Mr. Alex. Anderson in the Dutch Guiana, and sent under Aublet's name, I can find no distinguishing marks. Of *Heymassoli inermis* is no specimen in Aublet's herbarium, and as there is no figure and no description of it, it is truly an unknown plant.

Page 633. *Quivisia* of Jussieu is the same genus as *Quivisia* of Cavanilles, which the Editor has taken up under the name of *Gilibertia*, p. 682.

Page 634. *Passerina ciliata*, as it now stands in Reichards's edition of the *Systema Plantarum*, contains at least three different plants. As there is no specimen in Linné's herbarium with this name, the plant which he meant can only be ascertained by Clifford's herbarium, from which he originally described it. On examining this herbarium, I found on the paper which represents

Passerina 2. Hort. Cliff. four different Cape plants pasted; but the one to which the description in Hort. Cliff. applies, is *Struthiola virgata*, p. 277. Linné adds to his description, "Me hic dubia proposuisse synonyma Lectorem moneo, ob figuras & descriptiones imperfectas." Among these doubtful synonyms is the *Sanamunda* I. Clusii, on whose authority Spain is given as the native place of this plant; this wrong synonym and false locus natalis have no doubt led the Spanish botanists to look for *Passerina ciliata* in their country. The specimen in Sir Joseph Banks's herbarium, sent from Spain by Professor Ortega, under this name, has not properly ciliated leaves, but they are thinly covered with hairs. If Rauwolf's plant in Gronovii Flora Orientalis is the same as the Spanish plant, can only be determined by those who have an opportunity of examining Rauwolf's herbarium at Leyden. Bergius's plant is from the description evidently different from either of the above mentioned.

Passerina Metnan of Forskâhl (misprinted Metkan) is *Passerina hirsuta*. See Vahl, symb. 1. p. 29.

Page 635. *Tondin* of Schilling is *Paulinia pinnata*, p. 642.

XVIII. *Remarks on Centaurea solstitialis and C. melitenfis.* By James
Edward Smith, M. D. F. R. S. P. L. S.

Read October 2, 1792.

THE plant intended by Mr. Hudson in his *Flora Anglica*, edition 2, p. 377, by the name of *Centaurea solstitialis*, has never been well ascertained. It is said in Ray's Synopsis to have been found, by Mr. Bobart, about hedges in the neighbourhood of Cirencester in Gloucestershire; and Mr. Hudson adds Northfleet in Kent as another place of its growth, probably from his own knowledge, as he quotes no authority.

What is commonly preserved in our English gardens and herbariums under the name of *Centaurea solstitialis*, and taken for the plant of Ray and Hudson, I discovered, on receiving the Linnean herbarium, to be the *C. melitenfis* of our great master. I always, from that time, sought every opportunity of determining which of the two species ought really to be considered as belonging to our English Flora, but long without success, having never been able to see any undoubtedly wild specimens.

When in Languedoc, in the winter of 1786, I there gathered the Linnean *C. solstitialis*, and brought its seeds to the garden of

I my

my worthy friend, Dr. Gwyn, at Ipswich, where several of the plants came up and flowered. This species was never, to the best of my knowledge, seen in an English garden before, at least not in modern times.

On visiting Mr. Crowe, F. L. S. at Lakenham, this summer, he to my great surprize shewed me a recent wild specimen of the real *C. solstitialis*, gathered by himself in a grassy field at Arminghall, about two miles from Norwich, in a gravelly soil, where he assured me he had observed it for several years undoubtedly wild. Mr. Crowe himself did not consider this as a very important discovery, not recollecting that there was any difference between the plant he had gathered at Arminghall, and that we used to have in our gardens about Norwich ten or twelve years ago, the two species being indeed much alike at first sight. If indeed they had been the same, it might have been supposed that seeds had escaped from a garden, and planted themselves, or been intentionally sown, in the field above mentioned. But as the true *C. solstitialis* has never been in any garden, in this neighbourhood at least, except Dr. Gwyn's forty miles distant, and that not till the year 1788, I have no doubt that this species is really wild at Arminghall. Whether it may have been in former times introduced among corn from abroad, I cannot tell; it now grows among short grass, with all the appearance of a wild plant; nor are the farmers here in the habit of importing seed from abroad.

It remains therefore to be examined whether *C. melitensis* be likewise a native of our island or not. Perhaps the old herbariums in the British Museum may throw some light on this subject*, or the places of growth mentioned by Ray and Hudson may still afford the plant they intended.

* I have since examined them without obtaining any positive satisfaction.

The two species are easily distinguished by the following marks :

C. solstitialis has the lobes of the leaves acute, and especially the terminal one, which is perfectly deltoid. The scales of the calyx are each terminated by a very strong pale yellow spine, half an inch in length, accompanied by several smaller ones.

C. melitenfis on the contrary has all the lobes of its leaves rounded, and the terminal one remarkably so, and perfectly blunt, even retuse. The calyx is fringed with small brownish spines, of which the longest is not above one-third the length of *C. solstitialis*.—Both species have bright yellow flowers.

The figure in Gerarde's Herbal, the second edition, p. 1166, is added by Johnson, and represents the true *C. solstitialis* very well.

Norwich, Sept. 28.

1792.

XIX. *Description of Fucus dasyphyllus.* By Thomas Jenkinson
Woodward, Esq. F. L. S.

Read Oct. 2, 1792.

FUCUS DASYPHYLLUS. TAB. 23, f. 1.

F. fronde cartilagineâ ramosissimâ; ramis filiformibus subsimpli-
cibus, foliis cylindricis obtusis basi attenuatis sparsis.

Desc. **T**HE frons is bright red, cartilaginous, but considerably gelatinous and tender, pellucid, from four to six inches high; divided immediately from the root, which is not fibrous but discoid, into very numerous branches; these are either simple or again slightly branched, filiform, the size of small pack-thread, terminating in a blunt point. The lower part of the branches nearly naked; the upper clothed, but not very thickly, with leaves growing without order, from one to four lines long, and about half a line broad, the longest below, and growing gradually shorter as they approach the upper part of the branch; cylindrical, terminating in a blunt point, and very much attenuated towards their insertion; in substance very tender and gelatinous, of a paler red than the branches, and sometimes tinged with green. Some of these

these leaves are proliferous, having others more minute growing from their sides.

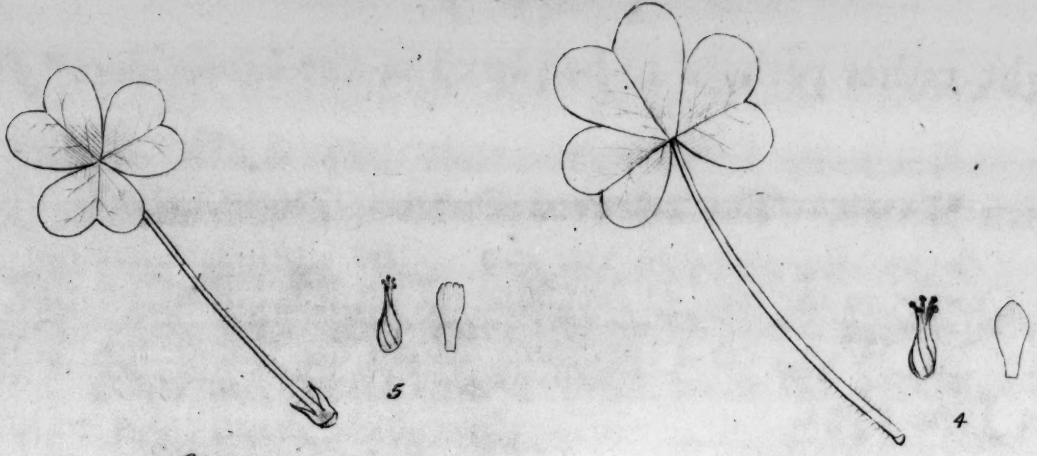
The fructification consists of minute sessile tubercles, numerous, but placed without order on the lower part of the principal branches, and sometimes, but rarely, on the leaves; dark red, so small as scarcely to be distinguished by the naked eye, unless the plant be moistened, but easily discernible with a common eye-glass.

The whole plant has somewhat of a granulated appearance, which, added to the gelatinous nature of the frons, has occasioned it to be supposed an *Ulva*; but this appearance is fallacious, the granulations under the microscope proving to be nothing more than the substance of the frons, in this respect agreeing with *Fucus rubens*, which submitted to the same examination has a similar appearance.

This *Alga* was first found a few years since, washed up by the tide at Yarmouth, by Mr. L. Wigg, an associate of this Society; and was then pronounced, by a highly respectable botanist, to be the *Ulva filiformis* of *Hudson*; but it does not accord with the specific character of that plant in the *Flora Anglica*, and whether it be at all described in that work seems very doubtful. At any rate the fructification, consisting of distinct tubercles totally projecting from the substance of the frons, sufficiently point it out to be a *Fucus*.

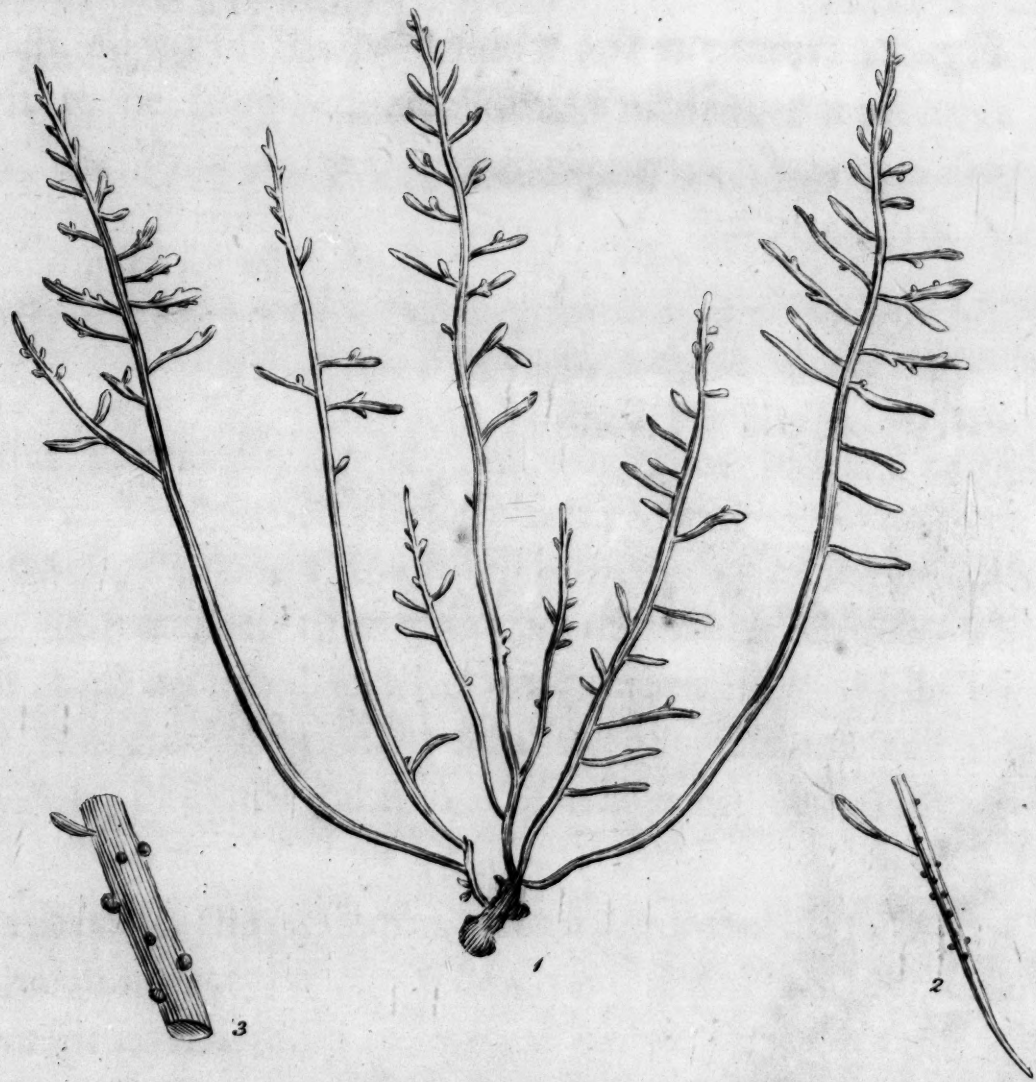
Its place in the System is next to *Fucus ovalis* (Fl. Ang.), which, in the substance of the frons, and form and disposition of the leaves, it considerably resembles, consequently in the subdivision, '*foliis distinctis*;' but as it is evident that both these plants have fleshy leaves, not differing in substance from the rest of the frons, they





O. pusilla, p. 243.

O. ambigua, p. 242.



Fucus dasyphyllus

they ought rather perhaps to be placed in the subdivision '*fronds tereti*.'

—ENGLISH NAME. Thick-leaved Fucus. Duration.?

HAB. *Cromer on the coast of Norfolk*.—The fructification first discovered by Mr. Wigg, on a specimen found on the beach at Yarmouth in June 1792.

TAB. 23.

- Fig. 1, represents the whole plant.
2, a branch in fructification.
3, the same magnified.

XX. *The Characters of Two Species of Oxalis.* By Richard Anthony
Salisbury, Esq. F. R. S. and F. L. S.

Read Oct. 2, 1792.

IN making a catalogue of the plants in my garden, having had lately occasion to investigate several *Oxalides*, the result of my enquiries respecting two species, which many botanists have thought only varieties, may possibly be interesting enough to be laid before the Linnean Society.

OXALIS AMBIGUA. TAB. 23. f. 4.

O. caule repente; foliis 3-natis; petiolis *semiteretibus, exstipulatis*; laminis emarginatis: corollæ laciniis *obovatis integerrimis*: stylis altitudine filamentorum longiorum, *patulis*.

Oxalis corniculata. Berg. *Phyt. v. 2. p. 17. cum Ic.* *Oxalis corniculata.* Muller, in *Fl. Dan. fasc. 15. p. 4. f. 873.* *Oxalis stricta.* Linn. *Sp. Pl. ed. 2. p. 624.* *Oxys lutea americana.* Dill. *Hort. Elth. p. 299. t. 221. f. 4.*

THOUGH the primary stems of this plant in some degree answer to the definition which Linné has given of the term
strictus,

strictus, yet the branches, which break out near the root, are constantly creeping, as in the following—There is, however, even in this respect, an obvious difference between them to the eye, but it is not easy to be concisely expressed in botanic language; and fortunately there is no necessity to have recourse to it for a specific character.

OXALIS PUSILLA. TAB. 23. f. 5.

O. caule repente: foliis 3-natis; petiolis *teretiuseculis*, *basī stipulatis*; laminis emarginatis: corollæ laciniis *obcuneiformibus*, apice *erosulis*: stylis vix altitudine filamentorum longiorum, fastigiatis.

Oxalis corniculata. Linn. *Sp. Pl. ed. 2. p. 623.* Trifolium acetosum corniculatum. Baub. *Pin. p. 330.* Oxys flavo flore. Clus. *Hist. Pl. lib. 6. p. 248. cum Ic.*

THE older botanists, regarding this plant as a species of *Trifolium*, gave it the specific epithet of *corniculatum*, from the figure of the seed-vessel, which in the present improved state of the science is very indefinite, being equally applicable to the whole genus. Above are all the synonyms I dare at present say certainly belong to it. It is perennial, but liable to be destroyed by severe frost, and always of much dwarfer growth than the former. I received the seeds of it from *Spain*, and it is also found wild occasionally in *Devonshire*; a certain proof of the mildness of that climate, where many other southern plants occur, such as *Pinguicula lusitanica*, *Sibthorpia europæa*, *Lobelia urens*, and *Erica vagans*. This circumstance, together with that of the *Arbutus Uedo* and *Andromeda Dabeocii*, which last grows also in *Teneriffe*, being found wild in *Ireland*, seems to strengthen the conjecture, that some violent concussion of the

globe has formerly removed these plants from warmer latitudes. The soil in which the above-mentioned plants severally are found, and the structure of their seeds, render it exceeding improbable that the sea should have transported them. To future geologists, who may have other data to ascertain so very doubtful a matter, possibly the facts recorded by the humble botanists of the present age may be of no small consequence, and serve, among many others, to rescue their labours from that reproach of inutility which is too often thrown upon them by those who are foolish.

XXI. *Description of a New Species of Warbler, called the Wood Wren, observed in May 1792. By Mr. Thomas Lamb, A. L. S.*

Read Nov. 6, 1792.

THE length is five inches and a half; bill horn-colour; upper mandible bent at the tip, and rather longer than the under; irides hazel; nostrils beset with bristles; top of the head, neck, back and tail coverts olive-green; throat and cheeks yellow, paler on the breast; belly and vent of a most beautiful silvery white; through the eye passes a yellow line; wings and coverts brown, edged with green; the tail consists of twelve feathers, rather forked, and of a brown colour, edged with green on the exterior webs, and with white on the interior, the first feather wanting the green edge; under part of the shoulder bright yellow; legs rather more than an inch long, of a horn-colour; claws paler.

This is undoubtedly a new species in England, and I believe a non-descript: it inhabits woods, and comes with the rest of the summer warblers, and in manners is much the same, running up and down trees in search of insects.

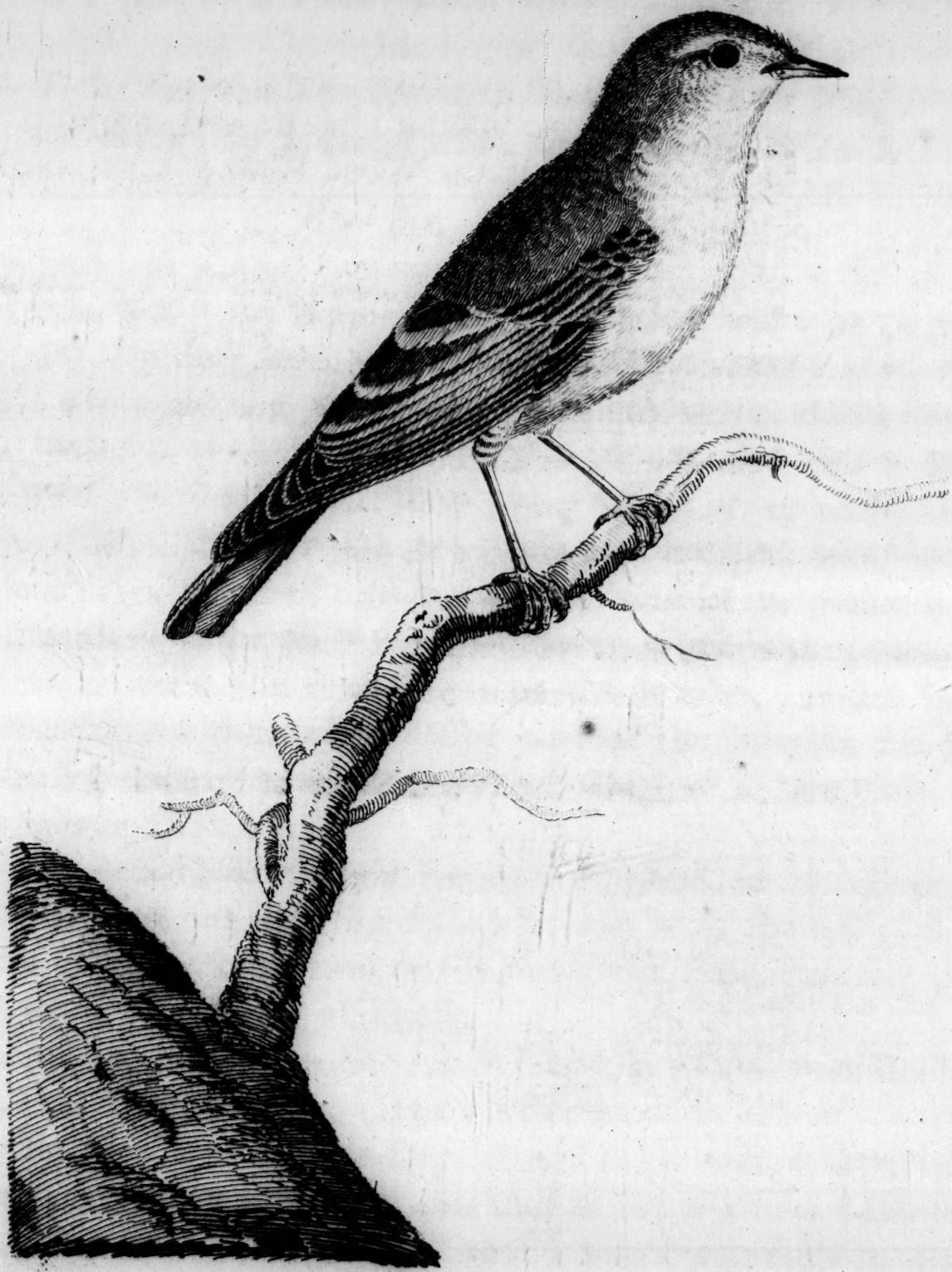
I heard it first, early in May, in Whitenight's Park, near Reading; it was there hopping about on the upper branch of a very high pine, and having a very singular and single note, it attracted my attention, being very much like that of the *Emberiza Miliaria* (Linn.); but so astonishingly shrill that I heard it at more than a hundred yards distance: this it repeated once in three or four minutes.

I never

I never heard these birds before last spring, and nevertheless I have heard nine in the course of a month; four in Whitenight's Park, and five in my tour to the Isle of Wight, viz. one in a wood at Stratfield Sea, one at East-Stratton Park, two in the New Forest, and one in a wood near Highclere: I have not heard it since June 6. Colonel Montague informed me he had met with it in Wiltshire, and had called it the Wood Wren; it has also been heard near Uxbridge.

It differs from the *Motacilla Hippolais* (Linn.), in being much larger, of a finer green colour on the upper parts, and more beautiful white beneath; also in the yellow streak passing through the eye, which in the *Hippolais* passes above and below the eye. It differs also from the *Motacilla Trochilus* (Linn.), in being larger, and white on the under parts, which are yellow in the *Trochilus*. The three which I opened were all males: I shall still continue my researches for the female with the nest and eggs; and if I should at any time meet with them, I shall with pleasure submit my observations to the Linnean Society.

TAB. 24. exhibits the Wood Wren of its natural size.



Wood Wren



XXII. *Observations upon the Structure and Oeconomy of those Intestinal Worms called Tæniæ.* By Mr. Anthony Carlisle, F. L. S.

Read Nov. 6, 1792.

THE following observations are offered to the Linnean Society, as an attempt to explain the mechanism and physiology of a very simply-constructed animal.

How far such investigations will assist in establishing that arrangement of Nature's works which Linnæus has planned, or how far those enquiries may aid in fixing doubtful connections, this Society are best able to determine*.

The habits and manners of *Tæniæ* are little known, because they live in situations where they cannot be observed, and therefore only become the subjects of examination when they are removed out of their natural situations, or after the death of the animal in whose body they have lived.

The *Tæniæ*, as well as many other worms that inhabit the bodies of living animals, appear destined to feed upon the juices of those animals which are already animalized; they are consequently found in the alimentary canal, and usually at the upper part of it,

* I cannot omit publicly acknowledging my great obligations to Mr. Watson, Mr. Hunter, and Dr. Baillie, for their liberality and friendship in permitting me to examine and make drawings from the worms in their respective collections.

where

where there is the greatest abundance of chyle, which seems to be the natural food of *Tænia*.

It does not appear that *Tænia* are calculated to live in any other situations than living animal substances. — That these worms should be created for the purpose of producing disease in the animal which they inhabit, is absurd; it would rather seem that nature has not intended any situation to be vacant, where it was possible to carry on the work of multiplying the species of living beings. By allowing them to live within each other, the sphere of increase is considerably enlarged. There is however little doubt that worms, and more especially the *Tænia*, do sometimes produce diseased states of the bodies which they inhabit; and we are also well assured, that worms do exist abundantly in many animals without at all disturbing their functions, or annoying them in the smallest degree.

Some diseased states of animal bodies are highly favourable to the increase of worms; as dropfy to that of hydatids, and the rot in sheep to that of the *Fasciola hepatica*, &c. But, in these instances, worms are rather to be considered as concomitants of diseases, than a source of them. When *Tænia* have arrived at some considerable growth, it appears that they always produce diseased affections. With respect to the probable duration of these animals lives, Mr. Hunter has given me permission to make the following extracts from a very curious history of a *Tænia* which is preserved in his collection.

“ *Marian Burgoin*, a native of Lausanne in Switzerland, at the age of fourteen years, was affected with pains in her stomach and head, rigors, &c.; these symptoms continued and were gradually increased. At the age of nineteen she came to England, and was advised to take purging medicines, by which she voided a portion of *Tænia lata*. She continued for some years to take drastic purges,
and

and repeatedly voided portions of this *Tænia*, which were generally about two yards in length; she voided, at different times, twelve of these pieces, but none of them had that extreme joint which is considered to be the head. About eight years after her coming to England, she took the Switzerland medicine, and afterwards the head, together with a large portion of this animal's body, were evacuated; she then perfectly recovered her health. From the foregoing history it is probable that the head of this *Tænia* had existed for the space of twelve or thirteen years; or if she had voided a head previous to her arrival in this country, we may still suppose the present animal to have lived eight years, because during this last period the history was accurately and attentively preserved."

It is a curious circumstance in the account of this woman, that she was considerably relieved from all her uneasy symptoms after voiding each portion of this *Tænia*; but in the course of three weeks they always returned as before, and were not alleviated until she voided another portion. May we not account for this by supposing that the body of the *Tænia* was gradually regenerated, after each piece, which we have mentioned, had been broken off; and that the symptoms returned and kept pace with the growth of the worm; its extension along the alimentary canal, and its attachments there, proving a source of irritation proportioned to its length?

There appears to be a series of distinct species of *Tænia*, each having its peculiar animal, like the *Pediculi* and *Acari*. The species of *Tænia* are however not confined *singly* to particular animals. Men are subject to several different species of them; and even the people of particular countries and climates are subject to particular species of *Tænia*. The people of England have the *Tænia Solium*, and rarely

any other species. The people of Switzerland have the *Tania lata*, &c.

The structure of *Tania* is very simple, for, being intended to be nourished by already digested food, they are destitute of the complicated organs of digestion.

The *Tania Solium* of Linnæus is the animal which I intend to describe particularly; but other species, and other similar worms, will be taken notice of, by way of illustration.

This animal is composed of a head, in which is a mouth adapted to drink up fluids, and an apparatus for giving the head a fixed situation. The body is composed of a great number of distinct pieces, articulated together, each joint having an organ whereby it attaches itself to the neighbouring part of the inner coat of the intestine. The joints nearest the head are always small, and they become gradually enlarged as they are farther removed from it; but towards the tail a few of the last joints again become diminished in size. The extremity of the body is terminated by a small semicircular joint, which has no opening in it.

The external parts of this animal are clothed with a fine membrane resembling cuticle; immediately under which there is a thin layer of fibres, lying parallel to each other, and running in the direction of the length of the animal's body: these fibres arise from a dense, white, opaque line of substance, which connects the individual joints together; and the layer of fibres, having clothed both the flatted sides of the joint, is inserted into the same kind of ligamentous substance which connects the next succeeding joints together.

The motions of this animal's body are always in the direction of these fibres, and from hence we may conclude that they perform the office of muscles. It may be worthy of remark, that these
fibres

fibres are not at all vascular, which shews that the actions of muscles are not necessarily connected with vascularity.

The head of this animal is composed of the same kind of materials as the other parts of its body; it has a rounded opening at its extremity, which is considered to be its mouth. See TAB. 25. fig. 1, 2. This opening is continued by a short duct into two canals; these canals pass round every joint of the animal's body, and convey the aliment, fig. 3. Surrounding the opening of the mouth are placed a number of projecting radii, which are of a fibrous texture, whose direction is longitudinal. These radii appear to serve the purpose of tentacula for fixing the orifice of the mouth, as well as that of muscles to expand the cavity of the mouth, from their being inserted along the brim of that opening: see fig. 2. After the rounded extremity or head has been narrowed into the neck, as is represented in fig. 2, the lower part becomes flattened, and has two small tubercles placed upon each flattened side; the tubercles are concave in the middle, and appear destined to serve the purpose of suckers for attaching the head more effectually. The internal structure of the joints composing the body of this animal, is partly vascular, and partly cellular; the substance itself is white, and somewhat resembles in its texture the coagulable lymph of the human blood. The alimentary canal passes along each side of the animal, sending a cross canal over the bottom of each joint, which connects the two lateral canals together. See fig. 3.

I have often injected three feet in length of these canals with coloured size, by a single push with a small syringe. The injection will not however pass from below upwards along these canals; I could never make it go in this direction beyond two joints, and it appeared to be stopped by valves in the lateral canals, situated

immediately below the places where the cross canals are sent off. The alimentary canal, as it is here described, is continued into the extreme joint, where it becomes impervious, there being no opening analogous to an anus. The individual joints have each a vascular structure occupying the middle part (see fig. 4.), which is composed of a canal passing from the top of the joint to the bottom, and from its sides are sent off a number of lateral canals nearly at right angles; these vessels contain a fluid like milk, which is also globular, and after the death of the animal it is found coagulated. When injecting this middle vascular structure, I have often made the injection pass into the alimentary canals, by a number of very small openings; but could never, on the contrary, inject the central vessels from the alimentary canals; it would seem as if there were a valvular apparatus fixed at the outer extremities of those radiated canals. The remaining part of the body is composed of a cellular substance.

The mechanism of those parts of this animal which are subservient to its subsistence being now described, it remains for us to take a general view of the manner in which the animal is nourished.

The materials composing even the most simple animals not being permanent, but suffering continual waste and growing unfit for their purposes, it becomes necessary to replenish this waste by taking substances into their bodies, called food; and this food afterwards becomes a part of the solids of the animal. The food which *Tænia* feed upon, perhaps requires little change before it becomes a part of the animal's body. It is taken in by the orifice which we have called the mouth, and being propelled into the alimentary canal, it is made to visit, in a general way, every part of the animal's body.

The

The central structure of vessels placed in each joint seems calculated to absorb the fluid from the alimentary canal, for the immediate purpose of sustaining and repairing the parts of the body in their vicinity, which is probably done by deposition, but there still remains a great deal of cellular substance into which no vessels enter*. Such parts of the bodies of these animals are possibly nourished by transfusion of the alimentary fluid into their cells, or it may be effected by the capillary attraction of their fibres. It appears that there are animals totally destitute of vascularity, as some species of Hydatids, Polypi, &c. in which transfusion of fit matter, or capillary attraction by their fibres, seems to be the only source of nourishment. As *Tæniæ* have no excretory ducts, the decayed parts of their bodies are, most likely, dissolved into a fluid which transudes through the skin like perspiration, and with this view the skin of this animal is extremely porous.

The senses of these animals are few, but still are sufficient for their purposes. I have never seen any thing resembling brain or nerves in the *Tæniæ*; but as they are highly sensible to stimuli, it is most reasonable to conclude, that they have a considerable portion of nervous matter in the composition of their bodies, that is, of such matter as is susceptible of stimuli. Indeed we can hardly conceive how any animal can exist without such matter in its compo-

* The *Tænia* seems to be one of the most simple vascular animals in nature, and its central structures of vessels appear to be more like reservoirs for the nutritious fluid, than circulating vessels, for the contained fluid can only be pushed out of one canal into another, and even then it will not have visited all the parts of the animal's body. Probably this kind of construction enables these animals to live for a considerable time without food, which their situation and imperfect form may render necessary. As this animal has no anus, it would appear that the whole of its alimentary fluid is fit for nourishment, and that no part of it is excrementitious.

tion*. *Tæniæ* have no particular organs of sense; the sense of touch is therefore the only evident source of intelligence which they possess.

The mode of increase or propagation of these animals appears to be principally by ova. Linnæus and many other naturalists speak confidently of the ova of *Tæniæ*, mentioning their shape, size, &c.; but I have never seen any thing like ova, which I could decidedly say belonged to these animals, excepting some globular bodies, which I saw by a powerful magnifying glass, in the ducts that open into the lateral oscula; see fig. 6. There is every reason to believe that *Tæniæ* produce ova, and that their ova, as well as those of other intestinal worms, are so constructed as to be very little perishable. From this circumstance they may pass along the circulating vessels of other animals, without having their lives destroyed. We cannot easily explain the phenomena of worms being found in the eggs of fowls, and in the intestines of a foetus before birth, except by supposing their ova to have passed through the circulating vessels of the mother, and by this means been conveyed to the foetus.

The openings in the edge of each joint composing the body of the *Tænia Solium*, are sometimes placed alternately on the opposite sides, and at other times are placed on the same side for three, four, or even five successive joints. These openings, which have been called oscula, are little concave, shallow cups, formed by the projection of the surrounding edges, which are thickened like lips; at the bottom of these cups there is a small opening leading into a canal,

* After I had written this essay, I learned that Mr. Hunter has entertained a similar opinion to that which is now stated, and which he applies to many of the lower tribes of animals. I also understand that he has adduced something similar to this in his lectures; and as I have attended those lectures, I cannot say that such hints (although at present lost to my recollection) may not have given rise to the opinion here adduced.

which crosses halfway over the body of the joint, and then turns downwards; here it ends, and does not communicate with any of the neighbouring vessels, as I have found by repeated injections.

The uses of these oscula seem first to be that of suckers or tentacula, for attaching the long body of this animal to the inner coats of the intestines; I have seen them serving this office, and it appears that the external lips and cup are chiefly employed in it.

The second use of the oscula appears to be subservient to generation; and the canals, see fig. 6. seem to be the oviducts. In a *Tænia* of this species, which I obtained before it was dead*, I observed at one part where it had formed a knot upon itself, that two pairs of these oscula were in contact with each other, and were agglutinated together by a viscid mucus. I was not at that time aware of the possible nature of this connection, and neglected preserving them in that state. I now suspect, however, that they were in the act of copulation, and that a mutual influence takes place previous to the formation of ova. From hence it appears that each joint is an individual, yet dependent upon the head and other parts for its subsistence, the means of propagation being as much in the power of every joint as it is in the power of a common snail, which is an hermaphrodite.

The chance of an ovum being placed in a situation where it will be hatched, and the young find convenient subsistence, must be very small; hence the necessity for their being so prolific.

If they had the same powers of being prolific which they now have, and their ova were afterwards very readily hatched, then the multiplication of these animals would be immense, and become a nuisance to the other parts of the creation.

* From a young woman in Hermitage-street in the year 1789.

Another mode of increase allowed to *Tænia* (if we may call it increase) is by an addition to the number of their joints. If we consider the individual joints as distinct beings, it is so; and when we reflect upon the power of generation given to each joint, it makes this conjecture the more probable. We can hardly suppose that an ovum of a *Tænia*, which at its full growth is thirty feet long, and composed of four hundred joints, contained a young *Tænia* composed of this number of pieces; but I have seen young *Tænia* not half a foot long, and not possessed of fifty joints, and still were entire worms. We have also many reasons to believe, that when a part of this animal is broken off from the rest, it is capable of forming a head for itself, and becomes an independent being. The simple construction of the head makes its regeneration a much more easy operation than that of the tails and feet of lizards, which are composed of bones and complicated vessels; but this last operation has been proved by the experiments of Spallanzani and many other naturalists.

I have seen a disjoined part of a *Tænia*, one of whose extremities had begun to put on the appearance of a head; the extreme joint had become rounded, and the broken end had assumed the form of a deep cup, of which the margin was platted in a radiated manner, and the surface of the torn stump was much smaller than it must have appeared when first broken. These circumstances corroborate the opinion of this second mode of increase, and indeed something very analogous is evident both in hydatids and in many vegetables. In Dr. Hunter's collection there are hydatids which are found in cysts of the liver, on whose internal surface are visible a number of small pearl-like vesicles, which are attached to it; this seems to be the mode of increase peculiar to these bodies. Chains of individuals having a mutual connection are very common in the vegetable kingdom: the common *Mentha* has a running root, which

which ties together a number of plants that are in other respects independent of each other: they become perfectly independent, and continue their existence without any inconvenience, after these connecting roots are divided; in this circumstance there appears to be some analogy between these plants and the tape worm. In the common potatoe there is a mode of increase, by forming a number of bulbs at the root, which is totally independent of sexual generation; these bulbs become separate individual plants after a year, and are then independent of their parent. Something similar takes place in the Tulip, and in the *Sempervivum globiferum*, where there is a mode of increase by forming clusters of leaves that in time are pushed off by succeeding leaves; these bulbs of leaves, having each a small root, take hold of some neighbouring earth, and become distinct beings: this natural operation is something like the artificial mode of increasing vegetables by cuttings.

When intestinal worms produce a diseased state of the animal's body which they inhabit, various remedies are advised for removing them, many of which are ineffectual, and others very injurious by the violence of their operation. Drastring purges seem to operate upon *Tænia*, partly by irritating the external surface of their bodies, so as to make them quit their holds; and partly by the violent contractions produced in the intestine, which may sometimes divide the bodies of *Tænia*, and even kill them by bruising. I would here propose the trial of a simple remedy, which (a priori) promises to be successful; I mean small shocks of electricity passed frequently through the regions of the abdomen; the lives of the lower orders of animals seeming to be easily destroyed by such shocks of electricity as do not injure the larger and more perfect animals.

In Mr. Goeze's very elaborate and important History of Worms, he has represented many species of *Tænia*. The heads are drawn very accurately, and elegantly engraved; but he has represented

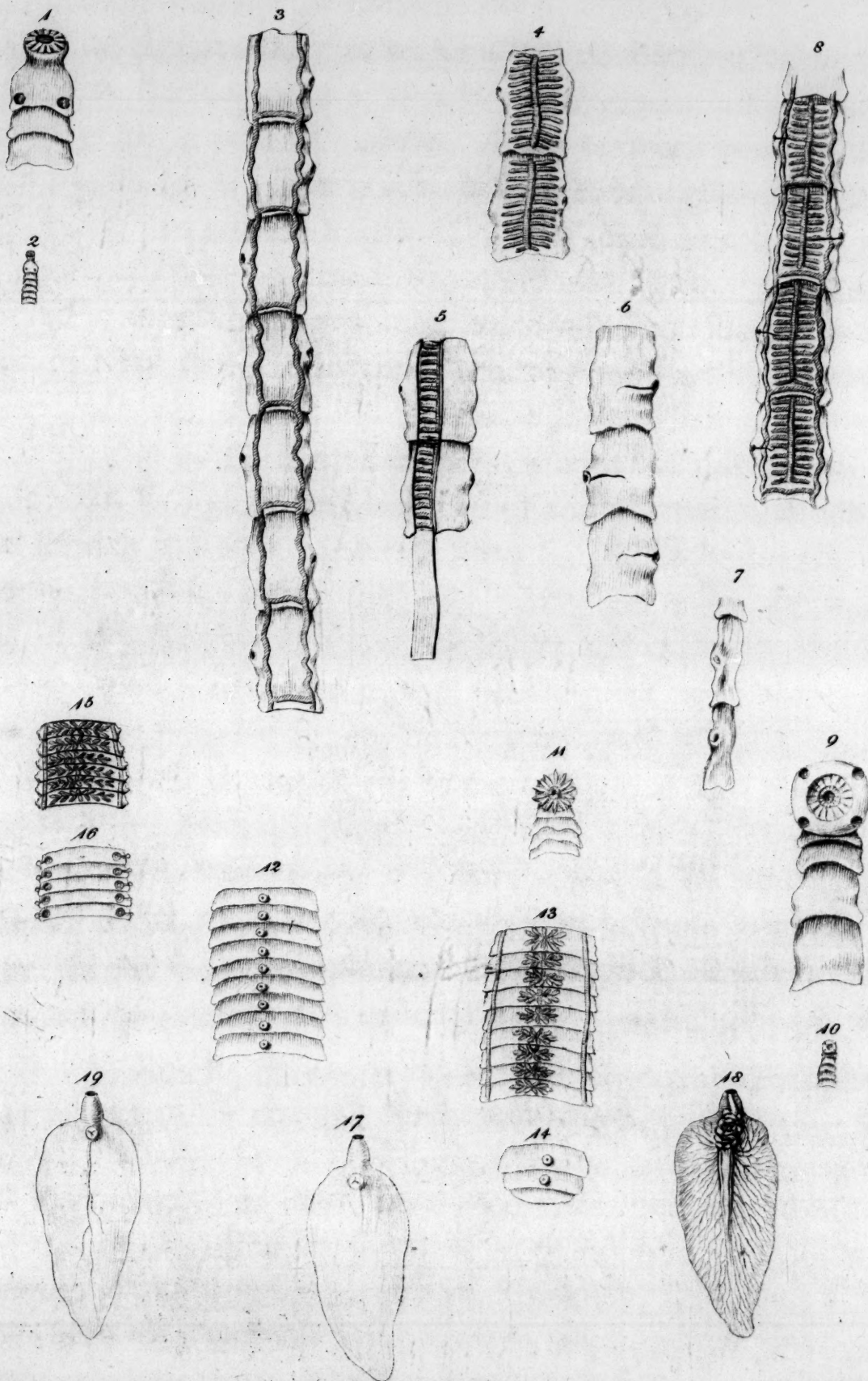
the vascular structure of *Tæniæ* to vary exceedingly in the different joints of the same animal: this is a mistake, and arises from his not having injected those vessels, but drawn them as they appear naturally. In this state the vessels are seldom all filled with the coagulated fluid, and those which remain empty are invisible: thus, in proportion to the number and relative situations of those filled canals, the structure will appear different; by injection, however, I have found them to vary extremely little in the different joints of the same animal.

In another instance Mr. Goeze appears to be mistaken; he supposes the lateral oscula to be connected by a duct with the middle structures of vessels. I have found, by repeated careful injections, that this never happens. Mr. Goeze seems also to have taken the middle structures of vessels for ovaria or oviducts, and has accordingly described the globules in the fluid which they contain as the ova: but this fluid being found coagulated after the animal's death makes it appear much more of the nature of blood, and, besides, I have seen it tinged with bile. In the delineations of the heads of *Tæniæ*, in Mr. Goeze's book, he has exhibited the fimbriæ placed round the mouths as evidently calculated to serve the purpose of tentacula, in the *Tænia Felis* particularly. Vide Goeze Eingew. pl. 24. fig. 3, 4.

Explanation of the Figures, TAB. 25.

THE drawings have been made from such portions of the worms as appeared best suited to illustrate their structure, more especially the formation and functions of those parts which seemed destined to serve the purposes of nourishing the animal's body, and of procreation.

The



Tenuia.



The different vascular structures were in most instances injected, and often dissected, to shew more clearly the arrangement of those vessels.

The parts are in general represented of the bigness which they appear to the naked eye, when contained in bottles of fine spirit. The heads are in most cases drawn from views through a magnifying glass. Representations of the heads and structure of other species are given by way of illustration; and the *Fasciola hepatica*, fig. 17, is exhibited to shew the great affinity (in structure) between that and *Tænia*.

Fig. 1. Shews the head of the *Tænia Solium* magnified: at its upper extremity it forms a circular plane, in the centre of which is a round opening, represented by the dark-shaded circle; this opening is the mouth, which leads by a duct into the lateral or alimentary canals. The mouth is surrounded by projecting radii, whose fibres run lengthways. From the extremity downwards there is a rounded narrow part which may be called the neck, below which it becomes flatted and broad, and two hollowed tubercles appear upon each flatted side; these are represented by the two dark-shaded spots.

Fig. 2. Is the same head, of its natural bigness, and which belonged to a *Tænia* twenty feet in length.

Fig. 3. Shews the alimentary canals, in a portion of the same *Tænia*, of their natural bigness. The dark-shaded undulating lines are the alimentary canals, which are seen to their full extent in this portion of the worm.

Fig. 4. Shews the middle system of vessels, in two joints, which are represented by the dark lines.

Fig. 5. Shews two joints, from one side of which a flip was torn down to shew the vessels underneath, and also the direction of the fibres in the flip, which are accumulated into little fasciculi like muscular fibres.

Fig. 6. Exhibits three joints, having the ducts leading from the lateral oscula injected; the dark transverse lines leading from each osculum, shew the size, direction, and extent of these ducts.

Fig. 7. Shews the edge of two joints turned forwards, and the appearance of the oscula in this point of view.

Fig. 8. Represents the whole of these canals in their relative situations.

Fig. 9. Exhibits a view of the head of a *Tænia* from the Dog*. The head is bent upon the neck, and presents a geometrical view of its face, which is flat, and has four tubercles situated at equal distances from each other; there are here two sets of radii surrounding the mouth, the innermost of which probably serve to open the mouth, whilst the outermost act as tentacula.

Fig. 10. Is the same head, of its natural size.

Fig. 11. Is the head of a *Tænia*† from the Cat, magnified. Here the radii project beyond the circumference of the head, and are aptly constructed for the purpose of tentacula; the tubercles are here four in number.

Fig. 12. Shews a portion of the *Tænia lata*, the oscula of which are situated in the middle of each joint.

* *Tænia canina*, Gmelin's Syst. Nat. Linn.

† *Tænia Felis* of Gmelin's edition of the Systema Naturæ.

Fig. 13. Shews the lateral alimentary canals of the *Tænia lata*, which have no cross canals, and the central vessels are of a star-like form, and extend only into a small part of each joint.

Fig. 14. Is the tail-extremity of the *Tænia lata*, which is destitute of any aperture*.

Fig. 15. Is a *Tænia* from the Ox†, having oscula on each edge of each joint. In this figure are represented the lateral canals as in the *Tænia lata*; but the central vessels are formed by radiated canals, which issue from a middle canal, running transversely over each joint.

Fig. 16. Shews ducts leading from the lateral oscula, which terminate in little annular canals; in these canals I have seen small opaque globular bodies: this is a portion of the last-described *Tænia*.

Fig. 17. Is a representation of the *Fasciola hepatica*, found in the bile-ducts of Sheep: the upper extremity is terminated by a narrow neck, having an opening at its end; this opening is the mouth. At the root of the neck is shewn a tubercle with a triangular cavity in it; this tubercle is partly for attaching the body in different situations, and partly for the purposes of generation.

Fig. 18. Shews a duct leading from the mouth into a convo-

* I was favoured with the following account of a perfect *Tænia lata*, which is preserved in Mr. Watson's museum. The account is transcribed from his catalogue.

Mr. Tatischeff, a Russian gentleman, had been long troubled with *Tænia*, and had sometimes voided portions of them, but was never perfectly free from them until he applied to a noted woman in Switzerland, who gave him a medicine, with much parade and secrecy, at bedtime, and the next morning he voided the above-mentioned worm, which he afterwards presented to Mr. Watson.

† *Tænia ovina*, Gmelin. Syst. Nat. Linn.

luted canal, which has much the appearance of intestine: this canal terminates in two vessels which are seen passing down the middle of the animal's body, and giving off a number of small ramifications; these pass towards the edges of the body, where they terminate, and the injection pushed by a syringe into the mouth fills the whole of these vessels. There is nothing like an anus.

Fig. 19. Represents a duct leading from the triangular opening in the tubercle: this duct is analogous to the oviduct of the *Tænia*, and doubtless serves the same purpose; it has no communication with the other vessels.

XXIII. *A New Method of preserving Fungi, &c. By William Withering, M. D. F. R. S. and F. L. S.*

Read Dec. 4, 1792.

FROM a conviction that many of the difficulties attendant upon the study of the Agarics, and some other genera of Fungi, arose from the want of a method of preserving them in a state fit for comparison one with another, I attempted some years ago to accomplish this purpose, by immersing them in various chemical liquids, and after some trials found it possible to preserve their habit completely, and in some measure also their texture and colours. By the same methods I also found that Mosses and Lichens might be preserved in great perfection.

A continued attention to this subject gave rise to a great number of experiments; but I shall not trouble the Society with the detail of them, rather confining myself to a more particular description of the two methods which I have found most practicable and efficacious, and only cursorily mentioning some of those that have failed.

No. I.

No. I.

To half a pound of vitriol of copper, called blue vitriol, reduced to powder, add a pint of cold water: stir them together for a minute, and then throw away the water: upon the remaining vitriol pour half a pint of boiling water, and stir them frequently until the liquor be nearly cool. Set it by in a warm place, for two or three days, to crystallize.

Take any quantity of these crystals, add to them as much hot water as will barely dissolve them, and put the solution into a vial.

To two or three quarts of pure spring water, put as much of this solution of blue vitriol as will give to the whole a very slight bluish tinge: then add to it, rectified spirit of wine, in the proportion of a pint to a gallon: filter the liquor through blotting or cap paper, and put it into bottles for use.

No. II.

Dissolve a quarter of an ounce of sugar of lead in a pint of distilled or very pure spring water, made boiling hot; add seven pints of pure cold water, and one pint of rectified spirit of wine: filter the liquor, and keep it in bottles.

The above proportion of spirits of wine is sufficient for the thickest and most succulent specimens, but less will do for such as are thin and not juicy. If the spirit be sufficient to prevent mouldiness, it is enough, for more has a tendency to extract the colours.

Put

Put the specimens to be preserved into wide-mouthed jars made of flint glass, and well fitted with corks: fill the jars quite full with one or other of the above liquids, so as to leave in as little air as possible: cork the jars very close, covering the corks with tin foil, or thin sheet lead, such as may be had from the dealers in tea, turning the edge of the lead or tin downwards so as to lap over and under the edge of the jar.

The dark-coloured plants are very apt to discolour the liquor, the milky ones to render it turbid, and some of the juicy ones to excite the vinous fermentation. In any of these cases the liquor must be repeatedly changed.

Agarics may be transported to almost any distance with little damage, by the following method. Put them into an earthen jar upon a layer of moss a little pressed down; cover them with more moss, carefully filling up the interstices; and thus go on stratifying them until the jar be quite full; pour in the liquor No. I. as long as the moss will continue to imbibe any; then stop the mouth of the jar securely. It may be useful to mention, that when several species are put into one jar, they may be labelled with slips of card paper, written upon with black lead pencil.

I have principally used the liquor No. I.; but No. II. is best adapted to preserve some of the more tender colours, and it also keeps the texture more firm. Let the botanist however be careful not to mix the liquors, nor to change one for the other after a plant has once been wetted with one of them.

Amongst the less successful attempts, I shall just mention that acids, even those of mineral origin, are apt to produce mouldiness; that neutral salts soften and destroy the texture of the plants; though perhaps a weak solution of common salt, with a

sufficient quantity of spirit of wine, might be used advantageously for the preservation of Fuci and other marine vegetables.

Earthy salts seem useless, except alum, which preserves them tolerably well for a time, but at length they are apt to become mouldy. Spirit of wine, either by itself or diluted with water, is an excellent preserver of the texture, but destroys the colour of the plants.

No doubt but future experiments will discover methods preferable to those now mentioned, and that we may at length hope to see the cabinet of the naturalist adorned with one of the most varied tribes of the vegetable creation.

XXIV. *Objections against the Perceptivity of Plants, so far as is evinced by their external Motions, in Answer to Dr. Percival's Memoir in the Manchester Transactions. By Robert Townson, Esq. F. R. S. Edinb.*

Read Dec. 4, 1792.

HOWEVER sanguine we may be in our expectations of extending the limits of human knowledge, we cannot avoid perceiving that there are boundaries which it never can exceed. These boundaries are the limited faculties of the human mind, which, though fully sufficient to answer all the purposes of common life, are an insuperable barrier to the enquiries of speculative men. None feel more the truth of this observation, than those engaged in physiological enquiries; the operations of nature being so complicated, and at the same time carried on in so secret a manner, as to keep us ignorant of the most common phenomena.

If physiologists have been unsuccessful in many of their enquiries into the animal œconomy, they have been still more so with respect to vegetables: for how little do we know at this day of the course of their fluids, and of the power by which they are moved? Are we not in the vegetable kingdom where we were near two centuries ago in the animal, when the great *Harvey* withdrew the veil?

The many beautiful analogies existing between the two organized kingdoms of nature, their similar origin from egg or seed, their subsequent developement, and nourishment by intus-fusception; the power of continuing their species, the limited time of their existence, and, when not carried off by disease and premature death, possessing in themselves the cause of their own destruction—have been so favourable to the supposition of the existence of a complete chain of beings, that there appeared to the favourers of this opinion nothing to be wanting to connect them, but the loco-motive faculty; for irritability, from phænomena in a few vegetables, had been granted them by some. This loco-motive faculty, which is considered as a consequence of volition, which is an attribute of mind, they say * is manifested in the direction of the roots towards the soil which affords them their most proper nourishment, and in the direction of the tender shoots and leaves towards the light, which is likewise necessary to their well-being. These facts are admitted, but not the consequences drawn from them.

It must indeed be allowed, that vegetables do on some occasions act as though possessed of volition, avoiding those things that are injurious to them, and turning towards those that are beneficial; thus appearing to act by choice, which must be preceded by perceptivity, a favour that nature has granted I think to the animal world alone. The following are brought as examples†:

A plane-tree twenty feet high, growing upon the top of a wall, straitened for nourishment in that barren situation, directed its roots down the side of the wall, till they reached the ground ten feet below. It has been amply repaid, say they, for its trouble ever since,

* Dr. Percival, *Manchester Transactions*.

† *Manchester Transactions*.

by plenty of nourishment, and a more vigorous vegetation has been the consequence. On another occasion, a plant being placed in a dark room, where light was admitted only through an aperture, put forth its shoots towards the aperture, which elongating passed through it; and this likewise was rewarded for its trouble by plenty of light and free air.

That appearances so similar to those that are observed in animals should be considered as proceeding from the same cause, viz. volition, is not to be wondered at, when so many of the inferior orders of animals hardly possess so much of the loco-motive faculty—particularly by men of warm imaginations, who, prepossessed in favour of an opinion, were grasping at every distant analogy to support it. Though, as I have said, we are by no means acquainted with the course of their proper fluids (*succi proprii*), or with the power by which they are moved, nor even can say by what power it is that the fluids, which are its food, are taken in; yet so far we know, that here, as in the animal œconomy, there is a constant change and evolution of their fluids, and that a constant supply is necessary, without which they soon perish. This supply, so necessary, must be taken in by absorption; and it is this act of absorption that I shall endeavour to prove to be the efficient cause of these motions in vegetables, and thus exclude volition from having any causation in these phænomena; for it is from their not having been explained upon mechanical principles that mind has been resorted to. Mind is in general our last resource when we fail in explaining natural phænomena. I could wish that physiologists were agreed upon the kind of absorption which takes place here, whether it be by active open-mouthed vessels, which in the common opinion takes place in the animal œconomy, or by capillary attraction, which is the most general opinion in the vegetable; but the theory

I shall offer to the consideration of the Linnean Society will agree with either.

The first consideration is—That an inert fluid is in motion.

Secondly—That, possessing no motion in itself, it owes this motion to the plant.

Thirdly—That as action and re-action are equal, whilst the plant draws the fluid towards itself, it must be drawn towards the fluid, and that in the reverse ratios of their respective resistances.

Now whether this absorption be performed by vessels acting as in the animal œconomy, or by vessels of the nature of capillary tubes, is of little moment, provided only that an absorption be admitted; for it is evident, that if action and re-action be the same, the absorbed fluids, which possess no motion in themselves, cannot be put in motion by the open-mouthed active vessels, without being drawn in the direction of the absorbed fluids. But should we prefer the theory which explains this absorption by capillary attraction, which theory I think is the most prevalent, we shall still find that the absorbing vessels are drawn towards the fluid. This is equally true as evident, whether applied to that simple hydraulic instrument, the straw, through which the school-boy sucks, or to the most complicated machine of the natural philosopher. These principles will, I think, be sufficient to explain those appearances in vegetables which have served as a foundation, or have been considered as signs of their perceptivity and volition, and which, as far as I have learnt, have never been attempted to be explained, viz. the direction of their roots towards the soil which affords them the best nourishment, and the young and tender shoots towards the light: for here is an absorption of water and light. The absorption of water is easily ascertained; but that of light, by its subtleness, eludes our experiments, with probably many other fluids of great importance

importance to the healthy state of the vegetable world. But to make the connexion more complete between the two organic kingdoms, it has not only been found that plants move towards their food like wise and intelligent beings, but they likewise turn aside from those soils, &c. which are injurious to them, or at least afford them but a scanty nourishment. This is a deception: it is only the immediate consequence of their motion towards their nourishment; for when the root of a tree or plant changes its course, on account of meeting with a rock, or with a hard, stiff, and barren clay, or other object that does not afford it proper nourishment, it is owing not to any dereliction of these objects, but to no attraction from absorption acting in that direction, but one from a more favourable soil. The smallness of the resistance of these fluids cannot be urged against this theory: the motion to be explained is only the tendency of the nascent shoots, no one having pretended that the solid wood could alter its direction; and this power, however feeble, is always acting. I am not ignorant that these are not the only motions which are thought to announce the perceptivity of plants. The motions observed in the stamina and other parts at the time of fecundation, the spiral direction of the stems of some*, the use of the cirrhi of others, and the bursting of the capsules, have all, with many other powers, been thought to favour this opinion. These are but powers nature has bestowed upon them for their preservation and pro-

* I have read, and heard it more than once asserted, that the *Lonicera* and other plants with the *caulis volubilis*, which are twisted either *dextrorsum* or *sinistrorsum*, can change this natural direction; so that when two *Lonicera*, or two branches of the same *Lonicera*, meet, the one turns to the right, the other to the left, that they may afford to each other a better support. This is a mistake, and, if true, would only counteract the intention of nature, which is a mutual support; for this would prevent their uniting so firmly together. Some of the cirrhi of the *Bryonia*, &c. turn to the right, others to the left, but not to accommodate one another.

duction, which can no more be considered as the consequence of volition, than the fall of their leaves at stated periods, their growth and decay, which have never been considered as the consequence of mind, any more than the increase or destruction of animal bodies, the efficient cause of which may for ever remain unknown.

When all is considered, I think we shall place this opinion amongst the many ingenious flights of the imagination, and soberly follow that blind impulse which leads us naturally to give sensation and perceptivity to animal life, and to deny it to vegetables; and so still say with Aristotle, and our great master Linnæus—*Vegetabilia crescunt & vivunt; animalia crescunt, vivunt, & sentiunt.*

XXV. *An Essay on the various Species of Sawfish. By Mr. John Latham, F. R. and A. S. S. and F. L. S.*

Read Jan. 8, 1793.

THE purport of the following paper is to endeavour to identify, as different species, the various kinds of Sawfish, which have hitherto caused much confusion, from being esteemed as mere varieties, or sexual differences of one and the same species, with the view of promoting a further investigation of the subject, which it is hoped this crude Essay may pave the way to. The matter is more particularly interesting, as very little has been added of late years, or indeed from the time of *Belon*; who, if I mistake not, was the first who gave a figure of any part of the animal*.

In regard to place in the system, most authors have fixed the *Sawfish* in the *Squalus* or *Shark* genus, with which it must be confessed it greatly coincides, excepting the elongation of the head into a *beak* or *snout*, which part in some measures one-fourth, in others more than one-third of the whole length of the fish: however, it cannot be denied, that it also resembles the genus of *Raia* or *Ray* in many particulars, which *Klein* gives for a reason when he wishes it to be placed between the two; though he hesitates to make it a distinct one. In respect to myself, I cannot but own,

* *Aquat.* 1553. 8vo. p. 66. a figure of the snout.

that were only a single species known to me, as was supposed by the ancients, I should most certainly join in the received opinion of placing it with the *Sharks*, though differing in some particulars, rather than to form a new genus for it.

It has been urged, that the difference of shape and size of the spines in the snouts of various subjects may arise from age or sex: the latter I cannot deny, as far as relates to the two first described, as the spines resemble each other more than those which follow; yet in regard to the first two, whoever will make a fair comparison will most probably join with me in separating them, till we have sufficient authority to unite them into one species.

The number of spines also, were no other distinction manifest, will of itself be sufficient to form a precise character for dividing the several species.

Klein observes, that in the embryo state the sides of the snout are as smooth as the gums of a new-born infant; but, in this case, we are inclined to think that the spines make their appearance not long after its exclusion, and that they grow very quickly; for in a specimen of the second species, now before me, the total length of which I conjecture to have been about thirty inches, the spines are full one-fourth as long as those of a nearly full grown specimen in the *Leverian Museum*. Another observation may likewise be drawn from the comparison of the snouts of the smaller sized with the full grown ones; for as some have been met with which measured only eight inches, and contained from thirty to thirty-four spines on each side; and others, of the very same species, of three feet in length, in which were found no greater number; may we not safely conclude, that they do not increase by being shed in the first stages of life, to be replaced by others, as in the jaws of the human species, and those of quadrupeds?

The

The *rostrum* or *snout* in every species which I have yet seen has been straight, or at most curved upwards in a very trifling degree, and the representations of it, in authors who have figured it, lead us to think the same; one instance only excepted, wherein a foetus of one with twenty-six spines in the rostrum is engraved, with that part bent in the form of a bow*: this surely must be a singular *lusus naturæ*; unless we can suppose it to have been bent while fresh, and so dried, in order to enhance the value of the specimen by exciting the wonder of the naturalist.

The *Sawfish* is said to be found both in the *northern* and *southern* parts of the world, and some have been met with of our first and second described of fourteen or fifteen feet in length, the snout measuring one-third of the total length. The ancients had but a very imperfect knowledge of the subject, when *Pliny* asserts, that *Pristes* are met with in the *Indian Sea* of two hundred cubits in length†, and in another place he calls it the mighty fish called *Pristis*‡. The same notion also had *Aldrovandus*, when he figured an ideal one of a cetaceous magnitude, with a crest on the front, spouting the water from tubes on the top of the head, in the manner of some of the *whale* genus. The same may also be seen in *Gesner*, *Piso*, *Marcgrave*, and others, who have copied from one another. On a level with these stands *Olaus*, who takes for granted, that the *Sawfish* is able to divide a ship in two with the *snout* §.

However, to say no more of such idle tales, it is certainly in the power of fishes of this kind to be injurious to the more defenceless.

* *Bloch. Fisch. Deutschl.* t. 120.

† *Plin. Nat. Hist.* lib. 9. cap. 3.

‡ *Id.* lib. 36. cap. 5.

§ "It will swim under the ships, and cut them, that the water may come in, and he may feed upon the men when the ship is drowned." *Olaus Magnus, Hist. Goth.* book 21. ch. 10.

*Fresier** saw a battle between several *Sawfishes* and a *Whale*, when all of them attacking the *Whale* at once, soon became victorious.

It is too plain, by the very little I have been able to collect of the natural history of the subject of this paper, that the ancients had paid but little attention to it: to elucidate the matter is reserved for the more enlightened naturalists of the present day; and it is to be hoped, that no opportunity of examination may henceforth be neglected by those who may be fortunate in having specimens, more especially recent ones, pass under their observation.

Those who may wish to retain the whole of the following under the genus of *Squalus*, will have no difficulty in adjusting them according to their wishes: on the other hand, such as agree with me in separating them therefrom, will see beneath an attempt to form a *new one* under the name of.

P R I S T I S.

Caput rostro elongato plano, utrinque spinoso.

Spiracula 4—5 ad latera colli.

Corpus oblongum, teretiufculum, cute aspera coriacea.

Os sub capite.

Nares ante *os*, lobo membranaceo semitectæ.

Pone *oculos* foramina ovalia duo.

Pinnæ ventrales approximatae, & in mare circa genitalia positæ.

Pinnæ anales nullæ.

* *Voy. de la Mer. du Sud.*

I. ANTIQUORUM.

Pr. rostro spinis validis utrinque 18—24. Tab. 26. f. 1.

Squalus Pristis, *Lin. Syst. Nat.* 1. p. 401. 15. *Faun. Suec.* 297.

Mus. Ad Fr. 1. p. 52. *Mull. Lin. Th.* 3. tab. 11. f. 2. (spin. 18.)

Gmel. Lin. 1. p. 1494. 15. *Fab. Fn. Groenl.* p. 130. 91. *Mull.*

Prodr. p. 38. 319. *Klein. Miss. Pisc.* 3. p. 12. No. 11. tab. 3.

f. 1, 2. (Pullus.)

Plin. Nat. Hist. lib. 9. cap. 2. *Clus. Ex. tab.* 14. p. 136 (spin. 20.)

Aldrov. Cet. p. 692. *Will. Isth.* p. 61. tab. B. 9. fig. 5. (fig.

Clusii.) *Raii Syn. Pisc.* p. 23. *Olear. Mus.* p. 41. t. 26. f. 1.

Rondel. Pisc. 487.

Bell. de Aq. t. in p. 66. (Langue de Serpent.)

Valent. Amboin. p. 33. t. 19. f. 52. *Bloch Fisch. Deutsch.* p. 37.

t. 120. *Du Tertre Ant.* p. 207. (Spadon.) *Bonann. Mus. Kirch.*

t. 288. t. 21.—*Cabinet de Ste. Genev. t.* p. 100. *Brouss. Act. Par.*

1780. p. 671. (La Scie.) *Pis. Ind. Occ.* p. 51. *Marcgr. Bras.*

p. 158. (Araguagua). *Gronov. Zooph.* p. 33. *Arted. Syn.* 66. Id.

Syn. 93. *Brown. Jam.* 458. 1.

Habitat in oceano.

Totum corpus ad 15 pedes longum, supra nigricans, seu leuco-phæo-griseum, abdomine albicante.—Caput antice planum.—Rostrum ad 5 pedes longum, spinis validis numero utrinque 18—24.—Os dentibus granulatis instructum.—Oculi magni iride aurea.—Pone oculos foramina duo oblonga.—Spiracula quinque.—Pinna dorsalis prima ventralibus opposita, altera inter primam & caudæ apicem media—Pectorales latæ longæque—Caudalis brevior quam congeneribus.

This species and the following grow to the largest size of any
5 which

which have yet come under the inspection of the Naturalist, some specimens measuring fifteen feet in length.

The head is rather flat at top, the eyes large, with yellow irides; behind each is a hole, which some have supposed may lead to an organ of hearing*. The mouth is well furnished with teeth, but they are blunt, serving rather to bruise its prey than to divide it by cutting. Before the mouth are two other foramina, supposed to be the nostrils. The *rostrum*, *beak*, or *snout*, is in general about one-third of the total length of the fish, and contains in some eighteen, in others as far as twenty-three or twenty-four *spines* on each side; these are very stout, much thicker at the back part, and channelled, inclining to an edge forwards. The *fins* are seven in number—viz. two *dorsal*, placed at some distance from each other—two *pectoral*, taking rise just behind the breathing-holes, which are five in number—two *ventral*, situated almost underneath the first *dorsal*—and lastly the *caudal*, occupying the tail both above and beneath, but longest on the upper part. The general colour of the *body* is a dull grey, or brownish, growing paler as it approaches the belly, where it is nearly white.

2. PECTINATUS.

Pr. rostro spinis angustioribus utrinque ad 34. Tab. 26. fig. 2.

Pristis seu Serra, *Gesner Aq. fig. in p. 728.* (spin. 34.) *Id. Ic. An. p. 171.*—*Mus. Besler. tab. 17. f. 3.* (spin. 28.)—*Id. f. 1.* (caput, spinis 25.) *Aldr. Cet. f. p. 692.*—*Johnst. Pisc. p. 8. t. III.*—(spin. 28.)—*Blas. Anat. p. 466. t. 49. f. 13.*—*Bloch Deutch. p. 37. t. 120.* (rostr. arcuat.) *Knorr. Delic. p. 56. t. H. 4.*—*Olear. Kunst. p. 38. t. 25. f. 1.*—*Pontop. Hist. Norv. II. p. 240.* (spin. 25.)

Habitat in oceano.

* Nos foramina hæc *meatus auditorios* esse credimus. *Willughb.*

Corpus a priore non multum differt.—*Rostr*i spinæ longiores, & minus validæ, numero variant a 25 usque ad 34.—*Pinnæ* posticæ magis excavatæ.

This and the former species have been confounded hitherto by Naturalists, nor are we certain that any others have been observed by them: and if we may judge by their figures of each, it should seem that the first described was the most plentiful. That figured in *Gesner* is far from a bad representation, and the one engraved by *Knorr* in his *Deliciæ* is sufficiently accurate. This species differs from the first, in having the *snout* more narrow in proportion at the base, and the whole of it more slender in all its parts; whereas the first is very broad at the base, and tapers considerably from thence to the point. The spines on each side also are longer and more slender, and vary from twenty-five to thirty-four in the different specimens: we have indeed been informed of one which contained no less than thirty-six spines on each side of the snout; but we must confess that we have never been fortunate enough to have seen such a specimen. This is supposed to grow to as great a size as the former, and in the general make and shape of the body does not materially differ.

3. CUSPIDATUS.

Pr. rostro spinis cuspidatis latis utrinque 28. Tab. 26. fig. 3.

Habitat — — — —

Rostrum huic per totam longitudinem latitudinis fere æqualis.—*Spinæ* abbreviatæ, latæ, planæ, ad apicem cuspidatæ.

Of this species I have only seen two specimens of the *rostrum*, one in my own collection, the other in that of Mr. *Parkinson*—the
first

first is about a foot and a half in length, the other more than two feet and a half: in both of these are twenty-eight spines on each side; but the distinguishing feature is in the spines themselves being particularly flat and broad, and shaped at the point more like the *lancet* used by surgeons in bleeding, than any other figure. We believe that no author has hitherto taken notice of this species.

4. MICRODON.

Pr. rostro spinis minutis vix rostrum exerentibus. Tab. 26.
fig. 4.

Habitat — — — —

Corpus ut in congeneribus, 28 pollices longum.

Rostrum planum, a basi ad apicem modice attenuatum.—*Spinæ* utrinque 18, minus conspicuæ.

A complete specimen of this fish is in the museum of Mr. *Parkinson*, which is probably unique; the total length is twenty-eight inches, the *snout* occupying ten; from the base of this to that of the *pectoral* fins four inches; between the *pectoral* and *ventral* fins six. The two *dorsal* fins occupy nearly the same proportions in respect to each other; but the hinder one is the smallest, and all of them are greatly hollowed out at the back part, much more so than in the two first species.

The *snout* differs from that of every other, in several particulars: it is longer in proportion, being more than one-third of the whole fish. The *spines* do not stand out from the sides more than a quarter of an inch, and from this circumstance seem far less capable of doing injury than any other species yet known.

5. CIRRATUS.

5. CIRRATUS.

Pr. rostro cirrato spinis longioribus: brevioribusque intermediis.

Tab. 26. fig. 5. and Tab. 27.

Habitat in *Nova Hollandia*.

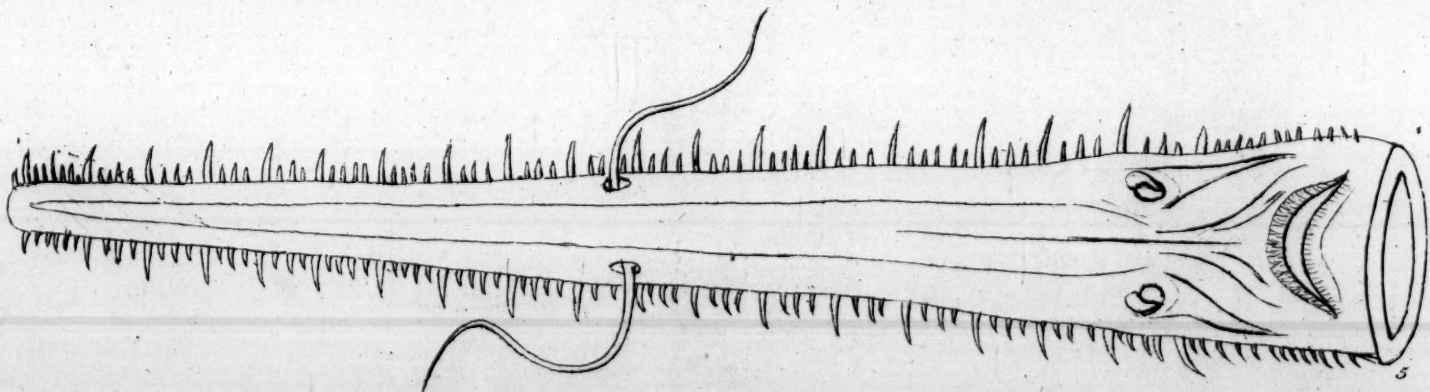
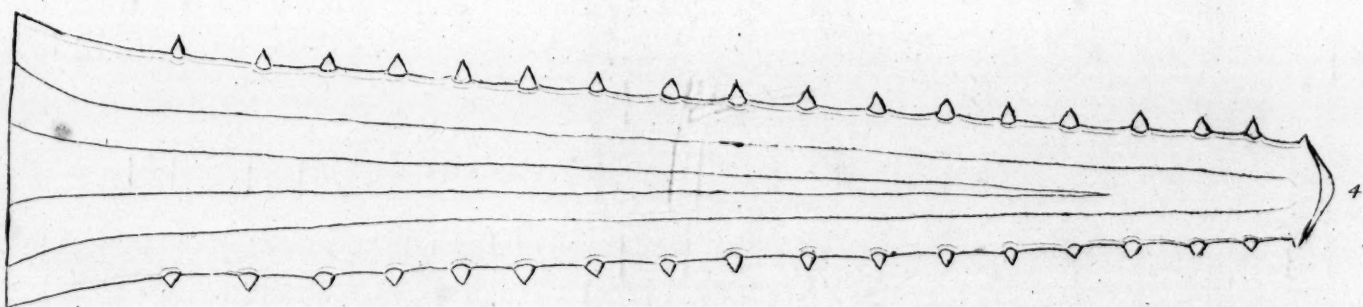
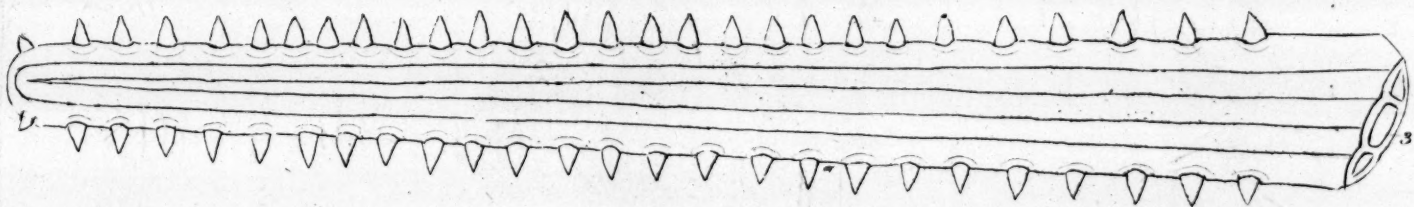
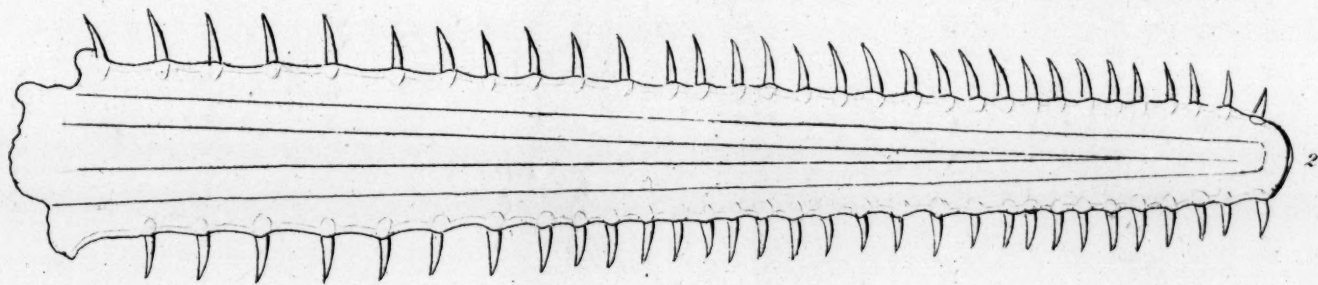
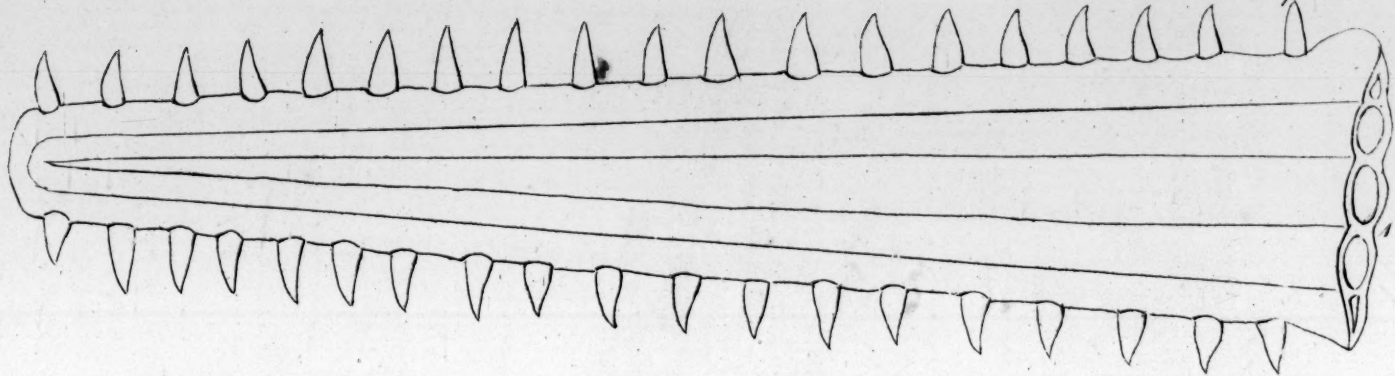
In hac specie *rostrum* spinis circiter 20 acutis, modicè incurvis, munitum; brevioribus a 3—6 interjectis—ad latera subtus utrinque cirrus elongatus flexilis.

Of this curious and singular fish we have only met with one specimen, which was brought from *Port Jackson* in *New Holland*, and is in the possession of *Thomas Wilson, Esq.* of *Gower-street*, who obligingly lent it to me, for the purpose of describing and figuring it.

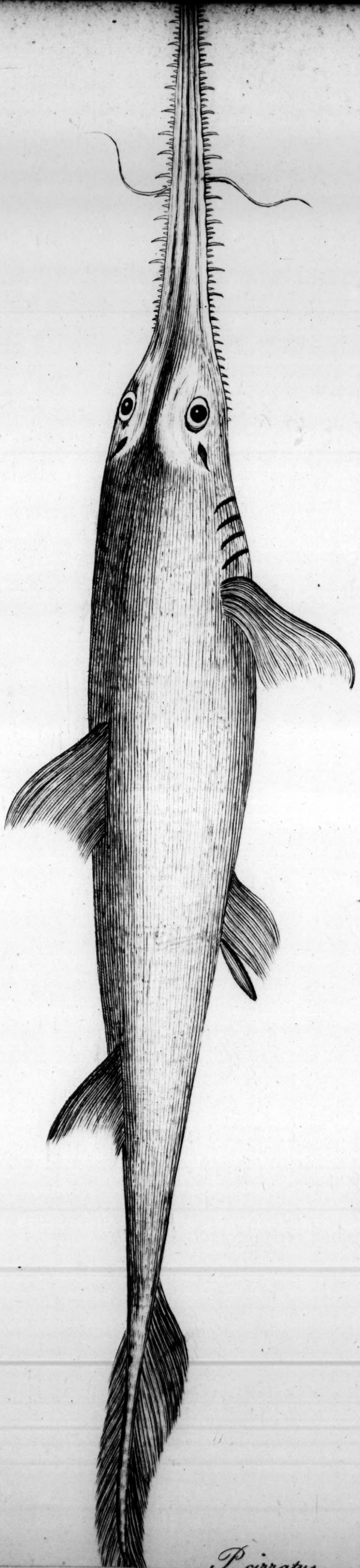
It is a *male*, and the total length about forty inches: the *snout*, from the tip of it to the eye, eleven: the *spines* widely different from any of the others; they are indeed placed, as usual, on the edge, but are continued on each side even beyond the eyes, as may be seen in the drawing. The longer ones are slender, sharp, somewhat bent, and about twenty in number; and between these are others not half the length of the primal ones, between some three or four, between others as far as six; and in general the middle one of these smaller series is the longest: besides these, a series of minute ones may be perceived beneath, at the very edge. In the *snout* likewise another singularity occurs:—about the middle of it, on each side, near the edge, arises a flexible, ligamentous cord, about three inches and a half in length, appearing not unlike the beards at the mouth of some of the *Gadus* or *Cod* genus, and no doubt as pliant in the recent state. The colour of the fish is a pale brown:

the *breathing apertures* four in number: the *mouth* furnished with five rows of minute, but very sharp *teeth*: as to the rest, as we have thought right to give a representation of the whole fish (Tab. 27.) a comparative view of the parts may be judged of without further description.

I do not doubt of the above specimen being a young one, as the snout seems to have shrunk much in drying:—but, to determine this matter, it is to be hoped that future voyagers, who may chance to visit that part of the world from whence this was received, will pay strict attention to the natural history of so curious a production of nature.







P. cirratus



XXVI. *Descriptions of Four New British Lichens.* By the Reverend
Hugh Davies, F. L. S.

Read Feb. 5, 1793.

1. LICHEN PILULARIS. TAB. 28, f. 1.

L. crustaceus cinereo-albidus, tuberculis pilulæformibus nigris.
Pill Lichen.

A Species unknown to every author I have seen. In examining it attentively, I find some of the younger fructifications perfect scutellæ, with elevated margins of the same colour; these are but few, and seem soon to lose that form. The fructification in decay changes into different shades of brown.

Found in Bodowen-park, Anglesea.

2. L. SIMPLEX. TAB. 28. f. 2.

L. ecrustaceus, tuberculis difformibus plicato-rugosis atris.
Simple Lichen.

THIS, hitherto undescribed, species has no ground, but consists of bare, small tubercles, which, examined with a microscope, appear wrinkled, and of various irregular forms. It seems to affect growing upon a kind of grey slate, which it covers to the extent of many inches together.

Since the drawing of it was taken, I have likewise found it on a sand-stone, and then, owing to the unevenness of the surface, the fructification assumes a still more irregular form, sometimes appearing in simple lines, and sometimes coiled; in some degree resembling the fructification of *Lichenoides*, t. 29. f. 116. *Dill. Hist. Musc.*

Found with the former.

3. *L. CONCENTRICUS*.*

L. crustaceus albidus, scutellis subimmersis confluentibus concentricis atris.

Concentric Lichen.

THE scutellæ are scarcely raised above the ground, depressed in the centre, and have a margin which varies in colour, being sometimes white, sometimes black. I could have supposed this to be *L. petræus*, *Jacq. Collect. T. 3. tab. 6. f. 2. litt. a. a. a.* from his figure; but he refers to *Michelius*, ord. 34. p. 99. n. 53. and to *Hall. Helv. nos. 2061 and 2062*, whose descriptions by no means accord with this plant; particularly, as neither of those accurate authors has noticed the confluent fructifications, which invariably form concentric segments of a circle, affording a most distinguishing characteristic.

Found in Whitford parish, Flintshire.

4. *L. VARIANS*. TAB. 28. f. 3.

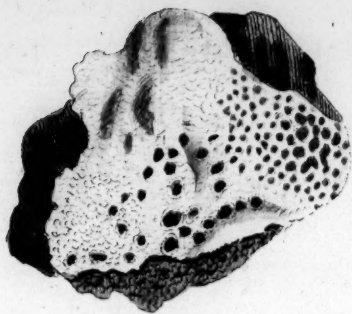
L. crustaceus albus, scutellis atris nitidis: margine albo.

Changeable Lichen.

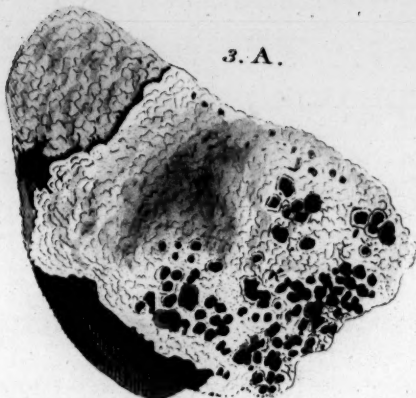
BY the several variations of this plant, represented at the figures A. B. C. D. it is evident that it varies exceedingly in respect of co-

* *L. petræus*, *Jacq. Coll. v. 3. 116. t. 6. f. 2. lit. a. a. a. synonymis dubiis.*

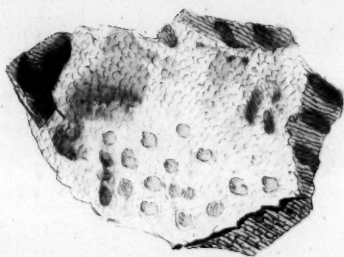
3. B.



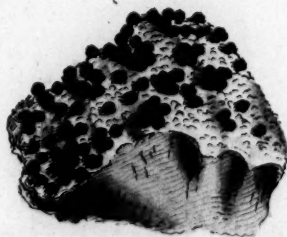
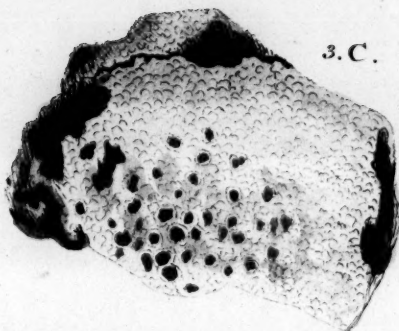
3. A.



3. D.



3. C.





lour, and, with an inattentive observer, might pass for different species. Its state of perfection is that described in the *differentia specifica*, when the ground is a fine polished white, and the fructification a bright shining black, with a white margin, fig. A. In its second state, it loses that glossy black, fig. B. In its more advanced stage, it becomes still paler; and in this state I have seen it in a collection under the name of *L. rupicola*, fig. C. As it approaches nearer decay, the scutellæ assume an ochreous or buff-colour, very different from either of its former appearances, fig. D.

In its last stage, which I had not observed till after the inclosed drawings had been made, it assumes a still very different appearance; the disks of the scutellæ disappear, and there succeeds a black dust, giving it in some measure the resemblance of a *sphæria*.

The singularly-various appearances of this plant afford an opportunity of observing how liable persons are to be deceived by plants of this tribe, which they have not an opportunity of examining in their places of growth; and may serve as a caution, that our zeal for discovering new subjects should not hurry us to create new species out of imperfect specimens.

Found on the S. W. side of Anglesea.

XXVII. *An Account of some Plants newly discovered in Scotland.*
By Mr. James Dickson, F. L. S.

Read Feb. 5, 1793.

ALTHOUGH a very great number of British plants are described in the *Flora Anglica* and *Flora Scotica*, yet no person can expect in these a complete catalogue of the plants of this kingdom; for, though their ingenious authors have done every thing in their power, yet, in a field so extensive, much must still remain to be done. Large tracts in Scotland are still unexplored by any naturalist, and many plants being merely local, we must wait for a more thorough and accurate examination of this kingdom, before we can fix the extent of the British Flora.

Indeed the operations of Nature are so dark and intricate, and her works so amazingly profuse, that it is much to be doubted whether we shall ever be able, with the most scrupulous investigation, to ascertain the number even of British plants, when we descend to the minuter tribes. The span of human life will be found too short to measure the vast field of creation.

But those who intend to search for plants ought not to be discouraged at their number, nor despair of success though they tread in the footsteps of some former naturalist; for every practical botanist must remember some instances of his discovering plants

in places he had often examined before; and the small plants are so numerous, and often so crowded together, that we need not wonder if they escape our most minute observation. Where a choice of place can however be had, the wild and unexplored ought certainly to be preferred, though we should by no means overlook the land in cultivation. Numbers of plants, not formerly known to be annuals, are frequently found even among the standing corn: I once found in such a situation five different genera upon a piece of earth half an inch square; they were the *Phascum subulatum*, *Phascum axillare*, *Bryum truncatulum*, *Jungermannia angulosa*, *Riccia glauca*, and *Blasia pusilla*.

In England, where cultivation has made so great a progress, we cannot expect to find such a variety of plants as in a wild mountainous country; yet, within these thirty years, some additions have been made to the *Flora Anglica*, though not equal to the numbers that have been added to the *Flora Scotica*.

As the Highlands of Scotland abound with such a variety of soil and situation, with high snowy mountains, deep glens, dripping rocks, torrents of water, and every other scene that can attract the attention of the naturalist, we may reasonably expect that, at some future period, very large additions will still be made to the *Flora* of that country.

I have frequently made a tour through the Highlands, and never without discovering some plants. I am sorry their number is as yet so small, but they may serve as a specimen of the botanical riches of the country, and induce some other naturalist to complete what I have only begun.

In a tour through the Highlands, in 1789, I discovered the following plants, which are mentioned in my *Fasc. Secund.* p. 29.

VERONICA alpina. *Linn. Spec. Plant.* 15. In montibus propè Garway Moor, et in Ben Nevis.

VERONICA

VERONICA faxatilis. *Linn. Suppl.* 83. in rupibus: *Ben Lawers.*

PHLEUM alpinum. *Linn. Spec. Plant.* 88. in montibus propè *Garway Moor.*

DRABA stellata. *Jacqu. enum.* 256. t. 4. f. 3. *Draba hirta Jacqu. aust.* 5. p. 15. t. 432. (non *D. hirta Linn.*) in rupibus: *Ben Lawers.*

HIERACIUM molle. *Jacqu. aust.* 2. p. 12. t. 119. in fylvis *Scotiæ australis.*

HIERACIUM villosum. *Linn. Spec. Plant.* 1130. in rupibus humidis: *Ben Nevis.*

HIERACIUM spicatum. *Allion. pedem.* 1. p. 218. t. 27. f. 1. 3. in fylvis *Scotiæ australis.*

ERIGERON alpinum. *Linn. Spec. Plant.* 1211. in rupibus humidis: *Ben Lawers.*

SALIX RETUSA. *Linn. Spec. Plant.* 1528. in rupibus ficcis: *Ben Lawers.*

In a tour, in 1792, the following plants enriched my collection.

VERONICA *humifusa*, racemo terminali, foliis cordato-subrotundis crenulatis, caulibus repentibus.

Descr. Planta tota prostrata; caules palmares et ultra, repentes, radicantes, ramosi.

Folia cordato-subrotunda, crenulata, scabriuscula, approximata, inferiora petiolata, opposita, sæpe terna vel quaterna, superiora plerumque sessilia et alterna. *Racemus* terminalis brevis. *Flores* pauci, conferti, breviter pedunculati, læte cærulei.

The above *Veronica* is that which is mentioned in the *Fl. Scotica*, p. 72. for *V. alpina*, and in the *App.* p. 1138. for a variety of the *V. serpyllifolia*: the first it is not, nor do I think it can be the last.

V. humi-

V. humifusa I never found but upon very high mountains, and under wet shady rocks, where the *V. serpyllifolia* never occurs; besides I have cultivated them both together in the garden for three years, and they always kept very different. *Dill. Giff. App. p. 67.* has a *V. nummulariæ folio*, and *Pluk. Phyt. tab. 233. f. 4.* *V. pratensis nummulariæ folio*, flore cœruleo; but I doubt neither of them is the *V. humifusa*.

ERIOPHORUM polystachion. Culmis teretibus, foliis planis, spicis pedunculatis. *Linn. Spec. Plant. 76. Vaill. Paris. tab. 16. f. 2. Leers Fl. Herb. t. 1. f. 5.* The figure given by Vaillant is a good one.

E. polystachion of Hudf. Lightf. Curtis, Withering, &c. is not the above.

I found this first in bogs in Northamptonshire, afterwards near Dunstable, Bedfordshire, and in Yorkshire, Cumberland, and very commonly in Scotland.

ERIOPHORUM angustifolium. Culmis teretibus, foliis canaliculato-triquetris, spicis pedunculatis. *Hoffm. Fl. Deutschland. p. 19. Vaill. Paris. tab. 16. f. 1. Curtis, Flor. Lond.*

This is our common *Eriophorum*, and has been mistaken for the *E. polystachion* of Linn. Linnaeus, no doubt, confounds the two together, and refers to the figure in *Vaill. tab. 16. f. 1.* only as a variety of his *polystachion*; but if he had ever seen both plants together, I have no doubt but he would have made them distinct species.

The following particulars may serve to shew in what this differs from the *E. polystachion*.

1. The root of that is not creeping.—2. The culmus is very erect.—

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P p

3. The

3. The leaves short and flat.—4. The spikes many, upon slender footstalks, and pendulous.—5. The involucre shorter than the spike.

ERIOPHORUM alpinum. *Linn. Spec. Plant.* 77. found by Mr. Brown and Mr. Don, in a moss about three miles east of Forfar, in the shire of Angus.

A specimen of this was presented to the Linnean Society some time ago by Mr. Teasdale.

GENTIANA nivalis. *Linn. Spec. Plant.* 332. Ben Lawers.

SIUM repens. *Jacq. Fl. Aust.* t. 260. Wet places in the south of Scotland.

SAXIFRAGA cernua. *Linn. Spec. Plant.* 577. Amongst the rocks on the summit of Ben Lawers.

STELLARIA cerastoides. *Linn. Spec. Plant.* 604. *Smith's Plant. Ic.* t. 15. Ben Nevis.

ASPLENIUM alternifolium. *Murray, Syst. Vegetab. edit.* 14. *Jacq. Misc.* 2. t. 5. f. 2. Rocks in the south of Scotland.

POLYPODIUM dentatum, nova species*. A figure and description of this will be given in my third Fasciculus. Rocky mountains of Scotland.

I found the following, not described in the *Fl. Scotica*, but in the *Flora Anglica*.

PHALARIS arenaria. Sea-coast, near Prestonpans.

LYSIMACHIA thyrsiflora. Woods in the south of Scotland.

DROSER A anglica. Near Fort Augustus.

BARTSIA alpina. Rocks to the east of Malghyrdy.

* P. dentatum. *Fasc. Pl. crypt.* 3. p. 1. t. 7. f. 1.

CAREX recurva. South of Scotland.

CAREX brizoides. South of Scotland.

SAGINA apetala. About Inverness.

ACROSTICHUM ilvense. Linn. Rocks of Ben Lawers.

This plant has been made a new *Acrostichum* by my friend Mr. Bolton, under the name of *A. alpinum*; and by Dr. Withering, *Polypodium alpinum*. I believe it is a *Polypodium*, but at the same time I am confident it is no other than the Linnean *A. ilvense*: I compared it both at Sir Joseph Banks's and at Dr. Smith's, and can find no difference but in size, the Scotch plant being somewhat the smaller; but those who are acquainted with ferns will be sensible how different they appear, according to their age or places of growth. I have no doubt, therefore, but the Linnean *A. ilvense* (Hudson's) and that I found in Scotland are one and the same.

XXVIII. *Remarks on the Genus Dianthus.* By James Edward Smith, M. D. F. R. S. and P. L. S.

Read March 5, 1793.

WHEN a tribe of plants has been known from the earliest times in which any plants were noticed at all, and has attracted the attention of all botanists, as well as of every florist and gardener, one would expect it should be well understood, and that its species and varieties should distinctly be known one from another. Unfortunately, however, for the acquisition of truth, the reverse seems generally to be the case. The assistance which the bulk of mankind lend to any disquisition requiring acute judgment or deep investigation does not always tend to elucidation, though infallibly in some way or other to confusion. Hence such an endless variety of opinions, obstinately maintained in proportion to the weakness of their foundations, upon subjects on which most has been thought and written; and hence in their turn new swarms of writings arise from each variety of opinion. Happily for the advancement of natural history, it has never been a very lucrative study; otherwise even the multiplicity of solid facts on which it is founded could scarcely have prevented its becoming as disfigured and obscure as many others that are.

No genus, except perhaps that of roses, justifies the above remarks more than *Dianthus*; nor is scarcely any one less understood. This obscurity does not seem to have arisen, as in the *Geranium* tribe, from a casual intermixture of species, either in a wild or cultivated state; nor does it, as in *Rosa*, originate in the species being immensely numerous, and very nearly resembling each other, though it must be confessed their specific differences are, like those of roses, very difficult to define by methodical characters. The chief source of confusion has been the incorrect labours of authors.

This genus, by the elegance and fragrance of most of its species, as well as the frequent occurrence of many of them throughout Europe, has been noticed more or less in every botanical publication. The older botanists, emerging as it were from a thick cloud of ignorance and book-learning, to a view of Nature in broad daylight, did not at once acquire the faculty of seeing; still longer were they in learning to describe what they saw. They seem to have looked upon the face of Nature as from a balloon in the air. They could distinguish a forest tree from a rose bush; they saw the earth was clothed with flowers, and one great refinement of their observation seems to have been, that some were red, yellow, or blue, others white; they discovered that the fields were green with grass, but scarcely noted that all grass was not the same; nor did they dream there were tribes below that rank of vegetables, scarcely less numerous than those above it, and no less accurately distinguished, no less carefully fostered by the beneficent hand of Nature, than all the gorgeous ornaments of their own flower-gardens. When the science began to make a progress under the superintendence of some rare genius of gigantic powers, as a Gesner or Cæsalpinus, while each of its footsteps was accurately noted and delineated by the scrupulous fidelity of a Clusius, facts on facts were gradually accumulated, and each new observation
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led the way to many more. Happy if all had been made with equal sagacity, and recorded with equal exactness! but every observer was not a Clusius or a Gesner, nor every delineator of plants a Fabius Columna.

The wooden cuts of that day, however wonderful in execution, and excellent for describing large distinct plants, in tribes whose forms are slender and delicate, and whose line of discrimination is small, are scarcely of any use, especially as they are seldom of the size of nature.

The genus of which I am about to treat, is one where figures have succeeded the worst. They have consequently been mistaken and erroneously quoted, more especially as not half the distinct species of *Dianthus* are figured at all in old authors, though their books contain numerous trifling and transient varieties of *D. Caryophyllus*, the favourites indeed of florists, but which a botanist would gladly resign for certain information concerning real species, important in the œconomy of nature.

The figures and accounts (for they can scarcely be called descriptions) of these plants in the earlier writers being therefore so confused, it is much to be lamented that systematic authors have quoted them with so little care. An erroneous synonym is worse than none at all. — Linnæus himself has been faulty in this respect.

Having long wished for some fixed ideas of a genus every day before one's eyes, and some species of which stand, the opprobrium of botanists, unnamed in every garden, I have made it my business to collect all the specimens possible, and to observe every herbarium that it has been my fortune to visit in different countries; hoping to learn at once to distinguish one species from another, and what authors intended by their different accounts. I had also in view at the same time the genus of *Arenaria*, still more

intricate in some respects; but its obscurity I have been more fortunate in removing than that of *Dianthus*. It may in a future paper, if this Society should think it worth their acceptance, be illustrated with some minuteness. I had destined the same pains to the genus of *Dianthus*; but, having found the confusion in herbariums and the descriptions and synonyms of authors inextricable, I am obliged now to content myself with offering detached remarks on the subject, like those on *Veronica* printed in the first volume of our Transactions. I take the species in their order, as in the fourteenth edition of *Syst. Vegetabilium*.

3. *D. ferrugineus*, *Mant.* 563. Linnæus quotes in manuscript *Miller's Icones* t. 81. f. 2, which is undoubtedly the plant, though an ill-coloured indistinct representation, which would be of no use if any obscurity hung about the species.
7. *D. diminutus*. Of this there is no specimen in the Linnean herbarium. All that I have ever seen so named, were evidently *D. prolifer*, varying with a single flower in each common calyx, as Linnæus himself seems to have been persuaded.
11. *D. rupestris*, *Suppl.* 240, is nothing else than *D. virgineus*, whose history I shall give in its place.
12. *D. glaucus*. What Linnæus intended by this is the little white pink with a purple eye, to be found in several gardens, and which many have thought a variety of *deltoides*, differing only in the white colour of its flowers, and in having four scales to the calyx instead of two, which is a variable circumstance. I
confess

confess myself unable to find a specific difference between them, and am persuaded Mr. Hudson is right in making it a variety in his *Flora Anglica*, for that it is what he intends by his *deltoides* β , I learned from himself, and his quotation of Dillenius, fig. 384, evinces it. The last mentioned author gives this as a British plant on report only: nor do I know any certain instance of its being found wild, except Mr. Lightfoot's authority in *Flora Scotica*, where it is rightly given as *D. glaucus* of Linnæus. One cannot but wonder Mr. Hudson should have applied this denomination, with its *differentia specifica*, to another plant, the Chedder pink, at the same time quoting Dill. f. 385, which has nothing to do with *D. glaucus*, and which Linnæus, indeed, by no less an error, makes a variety of his *D. virgineus*. This point I have already cleared up in *English Botany*, t. 62, describing the Chedder pink as a new species by the name of *D. cæsius*, of which therefore I shall say no more at present.

17. *D. arenarius*. For this little-known species Linnæus is the only certain authority. The specimen in his herbarium is from Sweden. The synonyms of Bauhin and Clusius he has erased from his own copy of *Species Plantarum*, and surely the *Armerius flos tertius* of Dodonæus, p. 176, ought also to be struck out. Nor do I find any good reason to depend on the synonyms of Le Monnier and Sauvages.

Neither has this any right to a place in our *Flora Anglica*. Mr. Hudson has assured me he meant, by his *D. arenarius*, the common pheasant's eye pink of the gardens, which occurs sometimes apparently wild on old walls, and seems to belong to *D. Caryophyllus*.

19. *D. vir-*

19. *D. virgineus*. Linnæus having originally described this in the first edition of *Species Plantarum* from Burser's Herbarium, preserved at Upsal, without having any specimen in his own, I had no means of determining it with certainty but by applying to Professor Thunberg, who very obligingly sent me a drawing of the original specimen, by which it clearly appears this is no other than the plant Professor Jacquin has rightly taken for *virgineus*, and figured in his *Flora Austriaca*, vol. 5. *append. t. 15*. I have it from himself. Linnæus, towards the latter part of his life, having had this pink in his garden at Upsal from the Alps, described it afresh, forgetting it was his own *virgineus*; and forgetting also that he had already named one *Dianthus alpinus*, he gave that denomination to this supposed new species. The latter error however his son corrected, publishing it in the Supplement by the name of *rupestris*. But another fault occurs in that work with respect to the synonym, *Caryophylleus primus*, *Clus. hist. p. 282, figura tenuis*. Linnæus wrote it *figurâ tenuis*, meaning that the figure, not the description, agreed with his plant. I beg leave however to assert that neither is by any means referable to it. This is the very same individual figure, printed in Dodonæus by the name of *Armerius flos tertius*, above mentioned. For what it was intended, I do not presume to determine; unless it may be my *cæsius*, with which the description of Clusius agrees pretty well. Yet here the weighty opinion of Dillenius in *Hort. Eltham.* is against me. The synonyms of this genus form the most inextricable botanical labyrinth I ever yet entered.

I gathered *D. virgineus* on the white limestone rocks opposite the post-house on Mount Cenis in August 1787. The stems were decumbent, not prostrate, and the flowers appeared to me inodorous. Linnæus remarks the contrary. It ought to

be removed to the division of *Flores solitarii, plures in eodem caule*. The specimen in Burser's Herbarium, being a meagre one, sufficiently shews why Linnæus placed it among those whose stems are single-flowered. I have reason to think, from the information of my most accurate friend Mr. Davall, F. L. S. this is commonly taken for *D. Caryophyllus* in Switzerland. What Haller has called it I do not yet know. His account of this genus is as confused as any body's.

20. *D. arboreus*. Of this Linnæus had no specimen, and he confounds under it two very different species. His specific character, *foliis subulatis*, agrees best with the plant of Tournefort; but in his own copy of *Sp. Plant.* he has erased that synonym, seeming thus to intend Bauhin's for his real *arboreus*. Yet he has added as a synonym, *Caryophyllus arboreus sylvestris, Alpin. Exot. 39. t. 38*, justly observing that the figure is bad. Indeed so execrable is this figure, and so incomplete the description, not a word being said whether the figure be of the natural size or diminished, which in this case would determine the point, that I cannot tell to which of these two most different species it belongs. Supposing it not to be a much diminished representation, it must be Tournefort's *Caryophyllus creticus arboreus, juniperi folio, Coroll. 23.* which I shall hereafter describe, and with which Alpinus's description of the "slender leaves resembling those of wild pinks, and the small flowers," agrees much better than with Bauhin's plant. The latter, which I venture to consider as the real *D. arboreus* of Linnæus, is very tolerably figured and described in John Bauhin's *Historia*, vol. 3. 328.

21. *D. fruticosus*. I am persuaded, from Tournefort's own specimens, this is only a variety of the last mentioned *arboreus*, having
8 broader

broader and obtuse leaves, but differing in no other respect from that of Bauhin.—They are both very noble and ornamental plants, and it is pity they are lost to our gardens.

The present remarks, imperfect as they are, would be still more so if I did not attempt to describe such new species of this genus as are certainly known to me, as well as to reform the specific characters of the others, some of which are at present quite insufficient, and even erroneous.

Those whose characters need no alteration I shall merely enumerate by the Linnæan names.

* *Flores aggregati.*

1. *D. barbatus.*
2. *D. carthusianorum*, floribus subaggregatis, squamis calycinis ovatis aristatis tubo brevioribus, foliis linearibus trinerviis.
3. *D. ferrugineus.*
4. *D. Armeria.*
5. *D. japonicus.* Thunb. Fl. Jap. 183. t. 23.
6. *D. prolifer.*

* * *Flores solitarii, plures in eodem caule.*

7. *D. diminutus*, anne varietas præcedentis?
8. *D. Caryophyllus*, floribus solitariis, squamis calycinis subrhombis brevissimis, petalis crenatis imberbibus.

9. *D. pomeridianus*, flor. solitariis, squamis calycinis ovatis acutis brevissimis; tubo apice tantum striato, petalis emarginatis subintegerrimis.

This is the only species I have ever seen whose calyx is smooth in the lower part, while the upper half is striated, and that very strongly and accurately.

10. *D. deltoides*, flor. solitariis, squamis calycinis ovato-lanceolatis acutis subbinis, foliis obtusiusculis subpubescentibus, petalis crenatis.

β. *D. glaucus* *Linn.* Varietas squamis calycinis sæpiùs quaternis, foliis magis glaucis, subinde glabris, limbo petalorum albo (nec carneo) semper cum lineâ transversâ purpureâ ad basin ut in α.

11. *D. chinensis*, flor. solitariis, squamis calycinis subulatis patulis foliaceis tubum æquantibus, petalis crenatis, foliis lanceolatis.

I have a plant from Mr. Sikes's garden at Hackney which seems a hybrid between this species and *D. barbatus*.

12. *D. monspeliacus*, flor. solitariis, squamis calycinis subulatis rectis tubo parum brevioribus, corollis multifidis, caule erecto.

13. *D. plumarius*, flor. solitariis, squamis calycinis subovatis brevissimis obtusissimis muticis, corollis multifidis.

14. *D. crinitus*, flor. solitariis, squamis calycinis ovalibus mucronatis subdivergentibus tubo triplo brevioribus, petalis multifidis imberbibus.

Caryophyllus orientalis, minimus, tenuissimè laciniatus, flore purpureo. *Tournef. Cor. 23.*

Habitat in Armeriâ. Variat flore albo. *Tournefort.*

Caules

Caules spithamei, læves. *Folia* linearia, angustissima, brevissima, obtusiuscula, lævia. *Flores* duo vel quatuor in caule, erecti. *Calyx* tubo gracili, striato, dentibus lanceolatis rectis acutissimis; squamis ad basin quatuor, exactè ovalibus, dorso striatis, mucrone brevi patente. *Petala* angusta, limbo ad basin usque irregulariter multifido-capillaceo, imberbi.

15. *D. superbus*, flor. solitariis paniculatis, squamis calycinis brevissimis acuminatis, petalis multifido-capillaribus, caule erecto.
16. *D. attenuatus*, flor. solitariis, squamis calycinis brevibus lanceolatis acuminatis subsenis; tubo apice attenuato, petalis crenatis.

Caryophyllus maritimus, supinus, foliis angustissimis, aculeatis, multiflorus. An Caryophyllus sylvestris repens multiflorus C. B. Prod.*?—*Herb. Tournef.*

Habitat in maritimis Galliae meridionalis, *Broussonet*. Ex horto regio Parisiensi etiam habui.

Caules diffusi, basi lignosi, tortuosi, ramosissimi; rami flori-feri adscendentes, pedales, foliosi, teretes, glabri, apicè in ramulis 2 vel 3 divisi, unifloris. *Folia* subulata, mucronatopungentia, glauca, margine scabra; caulina internodiis breviora. *Flores* carnei, inodori. *Calyx* squamis sex ad basin, quarum interiores sæpè margine membranaceæ; tubo striato, apicem versus sensim attenuato, dentibus erectis, margine membranaceis. *Corolla* parva, crenata, imberbis.

17. *D. pungens*, flor. solitariis, caulibus paucifloris, squamis calycinis brevissimis mucronatis patentibus; tubo gibbo, petalis integris.

* Nequaquam. Conf. *D. virgineum*.

18. *D. virgineus*, flor. solitariis, caulibus paucifloris, squamis calycinis brevissimis obtusissimis binis, petalis crenatis.

D. rupestris. *Linn. Suppl.* 240.

Caryophyllus sylvestris repens multiflorus. *Bauh. Pin.* 209.
Prod. 104. *Herb. Burser.* vol. 11. p. 99.

* * * *Caule unifloro herbaceo.*

19. *D. cæsius*, caulibus subunifloris, squamis calycinis subrotundis brevibus, petalis crenatis pubescentibus, foliis margine scabris.

D. cæsius, *Sowerb. Engl. Bot.* t. 62.

— *glaucus*, *Huds. Fl. Angl.* 185.

Armeriæ species flore in summo caule singulari, *Raii Syn.* 336.

Tunica rupestris, folio cæσιο molli, flore carneo, *Dill. Hort. Elth.* 401. t. 298. f. 385.

Habitat in Angliâ. In Helvetiâ, *Davall.*

Radix lignosus. *Caules* plures, spithamei, erecti, simplices, glabri, quadranguli, conjugationibus foliorum duobus vel tribus, uniflori, vix unquam biflori. *Folia* lineari-lanceolata, obtusiuscula, glauca, margine scabra. *Calycis* squamæ tubo triplo breviores, ovato-subrotundæ, obtusè mucronatæ, striatæ. *Petalæ* carnea, obtusè duplicato-crenata, basi lineata atque barbata.

20. *D. alpinus*, caule unifloro, petalis crenatis, squamis calycinis exterioribus foliaceis tubum subæquantibus.

Variat foliis obtusis & acutis.

21. *D. arenarius*.

* * * * *Fru-*

* * * * *Frutescentes.*

22. *D. arboreus*, caule fruticoso, foliis oblongis subcarnosis, squamis calycinis numerosis obtusis arcuè imbricatis brevissimis.

Betonica coronaria arborea cretica, *Baub. Hist.* 3. 328. f. 2.

β. *D. fruticosus*, *Linn.*

Caryophyllus græcus arboreus, *Leucoii folio peramaro*. *Tournef.*

It. v. i. 70, cum figurâ.—Nullo modo ab α differt, nisi foliis brevioribus, parum latioribus, & obtusis.

23. *D. juniperinus*, caule fruticoso, foliis subulatis, squamis calycinis subquaternis obovatis mucronato-pungentibus patulis tubo duplo brevioribus.

Caryophyllus creticus arboreus, *Juniperi folio*, *Tourn. Cor.* 23.

C. sylvestris arboreus, *Alpin. Exot.* 39, t. 38?

Habitat in Cretâ. Tournefort.

Caulis fruticosus, cortice rimoso lacero, ramosissimus, ramuli apice densè foliosi; floriferi elongati, cum oppositionibus 2 vel 3 tantum foliorum, internodiis multo breviorum, teretes, glabri. *Folia* subulata, angustissima, mucronato-pungentia, canaliculata, margine lævi. *Flores* bini vel terni in apicibus ramulorum, pedicellati, parvi. *Calycis* squamæ obovatæ, obtusæ, vix striatæ, margine apiceque membranaceæ, mucrone pungenti, divaricato, brevi, terminatæ, tubo duplo breviores; tubus striatus, dentibus acutis, margine hæud membranaceis. *Petala* crenata & incisa. *Styli* exserti, capillares.

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I have taken the liberty of altering the arrangement of the Linnæan species in some degree, introducing my new ones as much as possible according to their affinities. *D. pungens* not being at all more shrubby than many others, reckoned by Linnæus herbaceous, is most conveniently placed near those species, to which it is, in other respects, naturally allied.

XXIX. *The History and Description of a Minute Epiphyllous Lycoperdon, growing on the Leaves of the Anemone nemorosa. By Richard Pulteney, M. D. F. R. S. S. Lond. and Edin. and F. L. S.*

Read June 5, 1792.

IT is many years since I was first acquainted with the production, of which I now beg to lay an account before the Linnean Society. But, although it had frequently occurred to me, I had neglected to give it an accurate examination by means of glasses; having rested in the opinion which I had met with in several modern authors, that those *Tubercula*, or *Puncta*, as they have been most commonly styled, on the leaves of the *Anemone nemorosa*, were the eggs of an insect.

An opportunity of seeing some of these plants early this Spring, put it in my power to give these appearances a more exact scrutiny; the result of which convinced me, that these tubercles were themselves a vegetable production of a parasitical kind, and of the order of *Fungi*: of which, it may be remarked, that very few species are known to vegetate on the perfect and living foliage, although many inhabit the dead and putrid leaves, of plants.

Before I describe more minutely the Fungus in question, I will briefly recite what I collect concerning the plant on which it is

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found; which, on account of these tubercles, has, by some of those botanical authors who wrote soon after the restoration of botany, been considered as a distinct species. Hence some account of the plant becomes necessary to illustrate the subsequent observations; since, if I mistake not, some errors relating to it have remained undetected for upwards of two centuries.

After consulting all the older authors which I have it in my power to refer to, I can find no one who notices the singularity observable in the leaves of the *Anemone*, prior to THALIUS, a physician of *Northausen* in Germany; who appears to have been no inconsiderable botanist, at the period when he wrote. He with great diligence made a catalogue of the plants of the *Hartz*, or Black Forest, which was undertaken at the request of CAMERARIUS, and published by him after the death of the author, under the title of *Sylva Hercynia*, in 1588. In this work the author describes what he calls *Ranunculus Martii tertium Genus CORDI & TRAGI*. This genus he divides into five kinds or species, among which are included the *Anemone nemorosa*, and *ranunculoides* of LINNÆUS, and the moderns. I have only to notice what he remarks of his *Quintum Genus*, of which, however, it is unnecessary to detail his description at large. It is sufficient to observe, that he describes it as being always a *sterile* plant, and concludes with the following characteristic observation, which I give in his own words—"Hoc autem præ reliquis hujus
"ordinis generibus folia hæc peculiare obtinent, quod in dorso
"frequentibus veluti stigmatibus, seu punctulis protuberantibus
"sint picturata exasperataque." *Sylv. Hercyn.* p. 98.

Caspar Baubine, in his *Phytopinax*, p. 320. (which with respect to many of the plants is a more correct work than the *Pinax* itself) comprehends this variety under the synonyms of the *Anemone nemorosa*, adding, "Est et qui in dorso frequentibus punctulis protube-
"rantibus

“rantibus exasperatur:” which observation *John Bauhine*, his laborious brother, repeats in the *Historia Plantarum*, tom. iii. p. 413. *Caspar Bauhine*, again, in the *Pinax* itself, makes it his seventh species of the *Anemones sylvestres*, under the name of *Anemone nemorosa sterilis, foliis punctatis*, p. 177.

I find other authors also characterising this plant, as a variety of the *Anemone nemorosa*, by the epithets or trivial adjuncts *stigmatoïdes, insectorum vitium*, &c. Such are *Maurice Hoffmann*, in his *Flora Altdorfina* in 1662, and *Bromelius*, in his *Chloris Gothica* in 1694. But not having an opportunity of referring to these authors, I am unable to say how far their observations extend. It seems, however, that *Hoffmann* was the first who ascribed these appearances to the work of insects: but he does not say they were the eggs, but seems rather to consider them as the effect of punctures only. *Mentzel*, in his *Index Nominum Plantarum multilinguis*, printed in 1682, records it under the name of *Ranunculus nemorosus stigmatoïdes*, p. 258. But, in his *Pugillus rariorum Plantarum*, he goes much farther, and caught the idea of its resemblance to a Fern. “Hic absque flore crescit, et folia subtus tamque rubigine adspersa, “habet quasi in capillarem plantam degener.” By this description it evidently appears, that *Mentzel* had examined the plant in the mature state of these *Fungilli*, when indeed it bears a notable resemblance to a small Fern. The root of the *Anemone nemorosa* is known to creep in a horizontal direction; and *Mentzel* observes, that, unlike to the *flowering* species, which puts forth the leaf from the middle of the root, this *sterile* plant always sends up the stalk from one of the extremities. I mention this, since a few observations of my own, made by digging up the roots, tend to confirm the remark of this author. He notices further the length of the footstalk or petiole, which, with a paleness of the leaves,

distinguish these plants, at first sight, from the flowering plants of this kind.

Among the writers of our own country, Mr. Ray first records the plant as a variety under *Caspar* BAUHINE's name from the *Pinax* as above quoted; to which he adds, "Anemones sylvestris species "degener esse videtur." *Hist. Plant.* i. p. 624. Thus stood the matter until the publication of the third edition of RAY's *Synopsis*, by DILLENIUS; when a leaf of this *Anemone*, laden with these tubercles, which had been found by DILLENIUS, in BOBART's *Hortus Siccus*, had so far imposed upon the Professor, that he judged it to be a new species of Fern*, and introduced it into the *Synopsis* under the name of *Filix lobata globulis pulverulentis undique aspersa*, p. 125. *tab.* 3. *fig.* 1.

Whether Dr. HILL himself detected this error of Dillenius I am not informed; but as far as I know he was the first who revealed it, in his *British Herbal*, published in 1756, p. 12. and this with a flippancy of remark every where too conspicuous throughout that work, and which, in this instance, does less credit to his own candour and ingenuoufness, than it detracts from the accuracy of Dillenius, whom he tacitly endeavours to ridicule, under the appearance of rescuing the memory of Ray from the imputation of this error, although he must have known that no botanist could place it to Ray's account. I make this observation, because, in reality, it is as little wonderful that the plant, without the help of glasses, should, from these tubercles, have been mistaken for a Fern, if viewed when the *Fungi* were in their last period, verging to decay, as that, in their younger state, they should be mistaken for the eggs of an insect. Dr. Hill himself probably might have seen the

* Since the above was written I am enabled to add, by information from the present learned Professor of Botany at Oxford, that he has seen among *Dillenius's* papers a correction of the mistake by *Dillenius* himself. June 1793.

plant in the latter state, since his detection of the error (if it was his own) was but partial; he having, after all, considered the *puncta* as being effected by insects. He actually says, that "a small winged insect is apt to deposit its eggs on the under part of the leaves of this species," (speaking of the *Anemone nemorosa*) "and they somewhat resemble the round dots in which the seeds of fern are lodged." What degree of credit is due to this account, will be manifest from the subsequent history of the plant.

Although after this time neither HUDSON, LIGHTFOOT, MARTYN, LYONS, RELHAN*, nor any other author takes notice of this *Filix lobata*, yet some foreign writers of the most respectable note continued to advance the old opinion relating to these appearances on the leaves of the *Anemone*. "Foliis stigmatibus ex insectorum ictu notatis," are the words of HALLER, *Hist. Plant. Helv. tom. ii. p. 64*; and the accurate POLLICH, in his *Historia Plantarum Palatinatus electoralis*, adds, when speaking of this plant—"Variat quoque ubi folia minora ac latiora erant, lobata, subtus punctis nigris conspersa, quæ ab insectorum ictu nascuntur."

After having thus traced the history of this production down to the present time, I must observe, that, although it would be unwarrantable in me to assert that no insect ever deposits its eggs on the under side of the leaves of the *Anemone nemorosa*, yet I suspect that the want of a precise examination of these *puncta* has been the sole reason of perpetuating an error, and that these *puncta*, whenever found, have been in reality, not of animal, but of vegetable origin: and I cannot help presuming that the description I shall give, and the reasons hereafter alleged, but above all a view of the plant itself, which I herewith submit to the inspection of the Gentlemen of the Society, will sufficiently establish this opinion.

* *Aecidium fuscum*. Relh. Cant. Suppl. iii. 36.

Before I had examined these appearances more minutely, and with glassess, I had indeed doubted whether they were owing to the operation of, or were indeed the eggs of insects, from the circumstance, among others, of their being always found sparsely placed on the leaf, and not in the aggregated mode, as insects *usually* deposit their eggs. A favourable opportunity, this Spring, of seeing some of these leaves loaded with tubercles, confirmed my suspicions that they were not the eggs, the punctures, or even the work of insects, in any way whatever. Upon examining them with one of Mr. Adams's pocket lenses of three glassess united, I observed, that these tubercles were not merely placed on the outer coat, but that they originated beneath the cuticle or external film of the leaf; and that the young white *Fungus* might be discerned through this thin green coat. Others were seen just emerging with the coat of the leaf lacerated, and spread on the side of the *Fungus*. On each leaf they are very often seen in different stages of growth; some just appearing, others out, and with a puncture, or pore, just discernible on the top, which is the beginning of the aperture, that by and by enlarges, and the whole assumes a globular cup-like form, with lacerated edges, the cavity being lined with white dust, among which minute fibres or filaments may be discerned. When the *Fungus* fades, it becomes, from being perfectly white, first yellowish, then brown, and finally, each *Fungus* is resolved into a farinose particle resembling the fructification of a Polypody. This minute *Fungus* is somewhat allied in its habit to the *Lycoperdon epiphyllum* LINNÆI, as found on the leaves of Colts-foot; but differs in not being aggregate, nor of an orange colour. Some of them, at a certain stage of growth, bear some resemblance to the figures of the *Carpobolus* E. F. tab. 101. in the *Genera Plantarum nova* of MICHELI; but the edges are lacerated in our *Fungus*, and not in any instance divided into smooth-edged,

edged, regularly shaped segments, like those of the above-mentioned figures; neither have I, as yet, observed the appearance of a *Volva*. To this may be added, that, during all its state of growth, and at maturity, it preserves uniformly a white colour, changing when dead into a yellowish brown.

As far as my observations extend, I judge, that this *Fungus* is seldom found on full grown, vigorous, and perfect, or flowering plants; but on the leaves of seedling plants, or of the first year's growth. The plants on which it is found are usually smaller than the others, the leaves of a paler colour, and the footstalk more lengthened, the whole giving the idea of a weakened or morbid state: but whether these *Fungilli* render the plant always *sterile*, an epithet which *Caspar* BAUHINE and other ancient authors have applied to it, or whether they occupy it in consequence of its having become morbid, I do not decide*.

Having made my earliest observations on this *Fungus*, when in its younger state of growth, and cup-like form, I hesitated whether it should be ranked with the *Peziza* or *Lycoperdon* genus: but in marking its progress to its old and decaying state, there remained no longer any doubt in which genus it ought to be classed. I judge it may not unaptly be named and described as follows:

NOMEN.

Lycoperdon (*Anemones*) parasiticum sphaericum sessile discretum album; ore multifido lacero; pulvere albo.

DESCRIPTIO.

Tubercula viridescentia, discreta, magnitudine inter se nec multum discrepantes, intra folii cuticulam primùm discernuntur: mox erumpunt fungilli albi, mammiformes, poro in summitate notati:

* Mr. Relhan observed the contrary.

senfim dehiscunt in cyathos urceolatos five orbiculatos albissimi coloris; marginibus subæqualibus in lacinias numerosas sectis. Cavitas dum maturefcunt fungilli, pulpa, five lanugine filamentosa, pulverem album fundente, repletur. Vacuo per maturitatem demum cyatho, pulvis per totum folii discum dispergitur. Senescens, flavescentem, et per ætatem extremam subfuscum, induit colorem: totus demum fungillus in cæspitem quasi vel globulum farinosum, nigrescentem, filicum, vel specialiter polypodii, fructificationem æmulantem, contabescit.

Lycoperdo epiphylo *Linnaei*, in pagina inferiore Tussilaginis Farfaræ folii, crescenti, affine, sed non idem; differt enim quod discretum semper nec aggregatum. Color albus, nec aurantius; quod cyathi margines nec in octo tantum vel novem lacinias secti, sed plurimas et irregulares.

LOCUS.

Habitat in dorso *Anemones nemorosæ* foliorum virentium.

TEMPUS.

Verno viget tempore, dum planta cui infidet, virescit. Juniora folia plantarum fortè annotinarum, potissimùm videtur occupare hic fungus; et plantam, ut suspicor, sterilem esse reddit. Sparsim et sine ullo ordine, dorso folii solum, innascitur, inter omnes ejusdem generis, minimus hic fungulus; neque confluens neque aggregatus, rarius enim duo contigui videntur. Decem, quindecim, vel viginti, immo etiam triginta sæpè plura, ad centum rarius, in uno foliolo numerantur.

XXX. *Extract of a Letter from Mr. John Lindsay, Surgeon in Jamaica, to Sir Joseph Banks, Bart. P. R. S. and H. M. L. S. dated June 30, 1792.*

Read April 2, 1793.

SIR,

IN my last letter I mentioned I had sown some of the fine dust or farina from the fructification of *Lycopodium cernuum*, and that from the capitula, generally called antheræ, of *Bryum caespitium*, or a species very like it, but I then thought their success somewhat doubtful. I have since repeatedly sown them both, and in a proper situation find they grow very readily.

Encouraged by this, I sowed that curious part of the fructification of *Marchantia polymorpha*, composed of fine elastic filaments and small globules (commonly considered as the male parts), where none of these plants had ever been before. In a short time I found there several young *Marchantiæ*, which are now growing freely. I lament I could not get any of the genus *Equisetum*, for a similar trial; but am much inclined to believe that the farina, from its fructification, will likewise produce young plants.

From these instances of young plants being produced from those parts of the fructification of Cryptogamous plants which have been, as far as I have been informed, hitherto considered

as the male parts, I have little doubt but it would be found on a fair trial that, in a very great proportion of Cryptogamous plants, the real female parts have been mistaken for the male.

In this view the *Marchantia* bearing seeds of another kind in small sessile cups, which also readily grow, may give the appearance of unnecessary superfluity; but in this respect the *Marchantia* is not singular. May not this last kind of seeds be considered as in some measure analogous to those luxuriant productions of young plants in many vegetables (hence called viviparous) in place of seeds, rather than as a necessary part of the genuine fructification? Such examples are frequent in the tribe of *Gramina*, in the genus *Allium*, and others, and also among the Cryptogamous plants. There is a fern here, seeming a *Pteris*, growing by the edges of ponds, which is plentifully propagated by the falling of the leaves loaded with young plants into the water; yet this has its fructification and seeds in the usual manner, and the seeds readily grow.

ADDITIONAL REMARKS,

By JAMES EDWARD SMITH, M. D. P. L. S.

THE foregoing observations of Mr. Lindsay are highly worthy of attention, as confirming the Hedwigian theory of the fructification of mosses; and the result of his experiment on the *Bryum* was the same with those made on the same genus by Hedwig.

The raising of any species of *Lycopodium* from its farina has not to my knowledge been described as practicable; Mr. Lindsay, there-

therefore, has all the merit of an original observer. It is not to detract from his due praise, but to do justice to unostentatious ingenuity, that I now mention Joseph Fox, a journeyman weaver of Norwich, as having made similar experiments upon *Lycopodium Selago* with the like success. He shewed me, in the year 1779, young plants of this species raised from seed in his own garden. This humble observer, whose name has not yet appeared in any book, is the original discoverer of many rare plants in the county of Norfolk, and it is with pleasure I commemorate his former assistance to myself.

XXXI. *Descriptions of Three New Species of Hirudo. By the Reverend William Kirby, A. L. S. With an additional Note by G. Shaw, M. D. F. R. S. and F. L. S.*

Read May 7, 1793.

BEING desirous of adding my mite to the treasures of the Linnean Society, I take the liberty of offering a description of three species of *Hirudo*, which appear to me to be non-descript.

I. *HIRUDO ALBA.*

H. depressa alba interaneis fuscis ramosis, margine crispante, extremitate acutiuscula.

Description.—The *H. alba* is a species of singular beauty. Its colour is a most delicate white, which is interrupted by the elegant ramifications of the viscera, or interanea as Linnæus has termed them.

* These have the appearance of some of the most beautiful fuci. They begin a little behind the eyes (of which there are only two) in a point, and, proceeding as it were from a common rachis, grow gradually wider and wider till they arrive at the ovary where the rachis ends; but the ramifications parting off on each

* This elegant appearance of the viscera is lost when the worm is deprived of its proper nourishment. It then becomes entirely white.

fide

side furround the ovary, behind which they unite again, and terminate in a point at the tail.

The ovary itself is of an oblong form, and generally pointed at the ends. In it are usually two spots which have a luminous appearance. It contains three or four roundish eggs*.

This species assumes a variety of forms: when at rest it is somewhat ovate, but when in motion it becomes linear.

The margin is white, and very transparent, affording an elegant contrast to the interanea. At rest it is usually crisped, and frequently exhibits the appearance of many angular projections. These are sometimes reduced to four, of which two form a kind of hunch, one on each side, just below the head, and two just above the tail, which gives the little animal a very singular form. At other times its contour is indented by many sinuosities.

The extremity of the tail, though naturally acute, is sometimes so contracted as to appear rounded. Its motion is uniform.

When in motion it is usually between six and eight lines in length.

Found amongst the *Lemna gibba*, in the Autumn, in a flow stream.

2. *H. NIGRA.*

H. depressa nigra linearis abdomine nigro.

Description. This species is entirely black, of a deep rich colour like velvet, except that just above the tail there is usually a femipellucid spot of a whitish cast†.

* Upon examining one of these eggs sub lente, I discovered two black points upon it exactly similar to the eyes of the old one: whence perhaps it was a foetus, and this species viviparous.

† The whole worm, when kept long in water in a glass, seems to incline to an ash colour; occasioned perhaps by the want of its proper food.

I never

I never could discover that it had any eyes. When at rest it is nearly circular, but when it moves it becomes linear; and then the centre of the head is usually protended into an obtuse angle.

Its motion (if I may so express myself) is *beautifully* smooth and uniform; and it is a very amusing sight to observe these little creatures, in a clear shallow stream, on a calm day, by myriads smoothly gliding over its bed.

At rest it is seldom above one line in length, but extends itself to three when it moves.

Found in slow streams, I believe almost the whole year, upon aquatic plants.

3. H. CRENATA. Tab. 29.

H. subdepressa subovata striata striis transversis *annularibus?* margine crenulato.

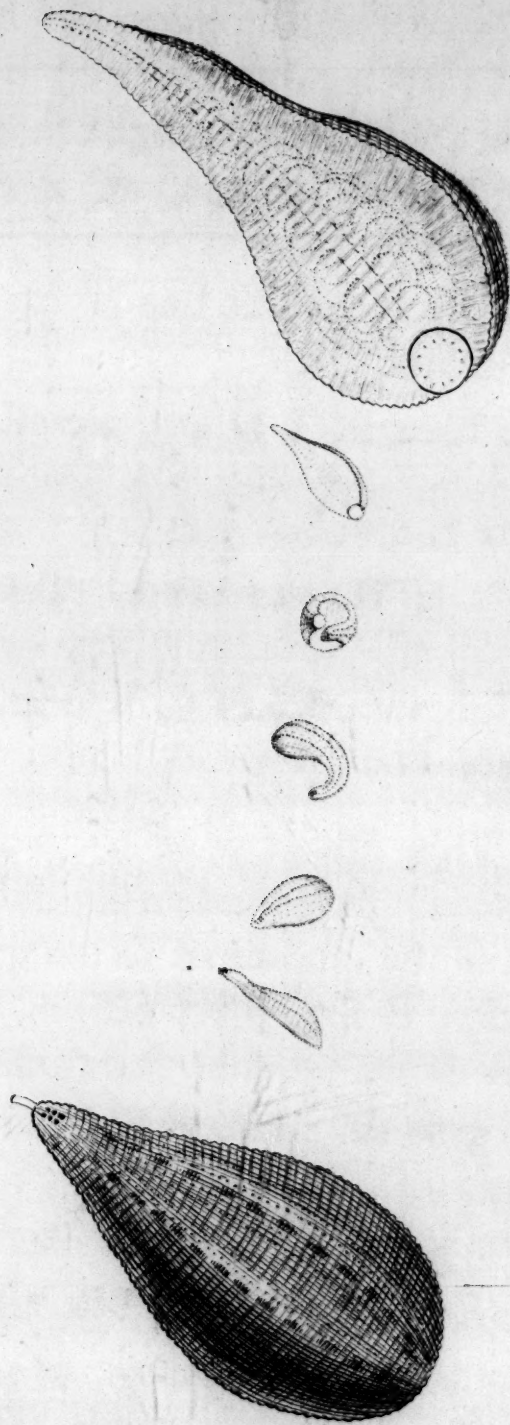
Description.—This species is of a greenish cast, sometimes inclining to ash-colour. It is transversely striated with annular striæ, from whence arise the crenatæ of its margin.

Its upper surface is somewhat convex. Its interanea are very visible by means of its vitreous transparency; they appear like so many separate granula. Its excrements I have sometimes seen appended to the anus, its form exactly resembling the interanea; they appeared to adhere to the worm, and to each other, by means of a gelatinous transparent excretion, which hung in places in oblong guttulæ.

It has two eyes only, which are very much approximated.

Its motion is very similar to that of the larvæ of the geometræ, and is performed by means of the adhesive property of the head and the tail. The tail being fixed to the sides of the glass, it extends

Linn. Trans. II. tab. 29. p. 318.



Hirudo crenata



tends its head to a point at the greatest distance from the tail where it adheres; then bringing its tail into contact with its head, it contracts itself into a hemispheric form, and by this mean moves very fast.

It has also another action in which it resembles the larvæ of the geometræ. When disturbed, it fixes itself by its tail, and then, raising itself perpendicular to the plane of position, moves its head from side to side, supported merely by the expanded adhesive orb of the tail.

I found this with the preceding ones, but it seems a rarer species.

Observation.—The *Hirudo alba* and *nigra*, as also the *viridis* of Dr. Shaw, appear to me not rightly referred to this genus, as they by no means agree with the Linnean definition. *Corpus oblongum ore caudaque in orbiculum expandendis se promovens*. The motion of these three species is uniform and equable, nor do they possess that orbicular adhesive expansion of the head and tail which constitutes the essential distinction of the genus *Hirudo*. Qu. Are they sufficiently distinct to constitute a new genus?

ADDITIONAL NOTE,

By DR. SHAW.

THE *Hirudo nigra* of Mr. Kirby I believe to be the *Planaria fusca* of Pallas and Gmelin, Syst. Nat. p. 390.

The *Hirudo alba* of Mr. Kirby is probably the *Planaria lactea* of Gmelin, described by Müller in the *Zoologia Danica*; and in the *It. Gothl.* it is considered by Linnæus as a *Hirudo*.

The

The *Hirudo crenata* of Mr. Kirby should seem by his description to be extremely near allied to the *Hirudo geometra* of Linn. and perhaps may be the same species in a young state.

Mr. Kirby's observation relative to these animals forming a distinct genus from *Hirudo* is unquestionably right, for in fact they are real *Planariæ*; and even the species described in the Linnean Transactions by the title of *Hirudo viridis* comes so near to the *Planaria punctata*, *viridis*, and *Helluo*, that it may be doubted whether it be really distinct, or a variety.

TAB. 29.

Exhibits the *Hirudo crenata*, in several different views, of its natural size, with two magnified.

ADDITIONAL NOTE.

By DR. SHAW.

The *Hirudo* of Mr. Kirby I believe to be the *Planaria* of Pallas and Gmelin, Syst. Nat. p. 390. The *Hirudo* of Mr. Kirby is probably the *Planaria* of Gmelin, described by Miller in the Zoologia Danica; and in the *Goëte* it is considered by Linnæus as a *Hirudo*.

Ad- XXXII.

XXXII. *Additional Observations on Fucus Hypoglossum*, p. 30. By
T. J. Woodward, Esq. F. L. S.

Read June 4, 1793.

IN the paper read before this Society, in which *Fucus Hypoglossum* is described, it is mentioned that this species was so named by the late ingenious Dr. Solander; but that, his papers on the genus *Fucus* being lost, no information from him could be met with on the subject. Since that time, these valuable manuscripts have been recovered by the diligence of Mr. Dryander and Mr. T. F. Forster jun. and are now safely deposited in the library of Sir Joseph Banks.

It was not till after the sheet containing my account of this *Fucus* was gone to press, that I received information of this discovery; when Sir Joseph Banks not only permitted me freely to examine and make extracts from these papers, but allowed me to make such use of them as might be necessary to elucidate this or any other of the British *Fuci*. In consequence of this permission, I now lay before the Society Dr. Solander's specific character and observations; premising, that being in doubt whether the plant was dioecious or not, the Doctor has described it as two distinct species, but remarking, that they were probably to be considered as male and female of the same species.

Fucus Hypoglossum,

Caule alato ramofo, foliis planis lanceolatis acutis è costâ proliferis, fructificationibus feriatis utrinque ad costam dispositis.

Habitat in oceano Anglicano Cornubiensi, et propè Insulam Vectis.

Ruber, sæpè spithamæus, tener, membranaceus. Costâ frondes etiam tenerrimas percurrit uti in *Fuco lingulato* Manuscripti, à quo differt foliis longioribus acutis, et præcipuè fructificationibus minutissimis, seriatim in lineas utrinque ad costam dispositis.

Fucus lingulatus,

Caule alato ramofo, foliis planis lanceolatis obtusis è costâ proliferis, fructificationibus globosis solitariis costalibus.

Habitat in oceano Anglicano Cornubiam alluente, et propè Insulam Vectis.

Ruber, parvus, tener, membranaceus, vix palmaris. Caulis seu costâ à radice per ramulos ultimaque folia extenditur, è quâ folia seu frondes teneriores excrefcunt.

Fructificationes etiam è costâ erumpunt.

An fœmina Fuci hypoglossi Manuscripti?

It is to be observed, that the specific characters, as above given, differ only in the leaves being acute or obtuse, and in the fructification; and at the end of the note on *F. lingulatus*, Dr. Solander expresses his doubts whether this be not the female of *F. Hypoglossum*. It is probable that he afterwards considered it absolutely as such, as no specimen of *F. lingulatus* is to be found in Sir Joseph Banks's Herbarium, unless a small one on the same paper with *Hypoglossum*, but unnamed, be supposed to be what was originally called.

called so; which from the circumstances I am induced to think it was, and that the Doctor was afterwards satisfied they were not distinct. This specimen has unfortunately no fructification, which, had it been present, would have cleared up all doubts, as the specimen of *Hypoglossum* has the fructification described in the specific character. Since my description was written, I have had occasion to observe, that the leaves of *F. Hypoglossum* vary extremely in shape; some being almost linear, whilst others are linear-lanceolate, or lanceolate; and in some specimens they are to be seen approaching to oval.

I have now reported this matter to the Society, and request they will permit it to be printed in the present volume of their Transactions, that the public may be informed that the manuscripts of Dr. Solander, which I had stated to have been missing, are now recovered. This I am the more anxious to do, lest, from the general agreement between the specific character and description as given by Dr. Solander, and my own, it might be suspected that I had made use of his notes, not only without acknowledgment, but for my own purposes declaring them to be lost, when they were actually in existence. I am happy therefore in knowing, that, however flattering this coincidence must be to me, the testimony of Mr. Dryander and Mr. Forster will be amply sufficient to acquit me from any charge of plagiarism.

*Additional Note to the Essay on the Stellated Lycoperdons, referred to
L. recolligens, at p. 58. By the same.*

AT the time this Essay was written, the Histoire des Champignons of Mr. Bulliard was not published, nor was his pl. 471 extant,

where this species is excellently figured; MN representing the small and more common, and L the larger, and (with us) scarcer variety. The few and equal rays, and the depressed sessile capitulum, convinced me instantly, on inspection, that the *Lycoperdon* there figured could be no other than the *recolligens*; but had I doubted, the observation, tom. I, p. 161, where the author speaks of the hygrometric properties of his plant (to which the *L. stellatum* has no pretensions), must have carried absolute conviction with it. Pl. 238, of the same author, I am now certain, represents the same species, though the figures are not so good. These plants had not, at the time of publishing that plate, fallen much under Mr. Bulliard's observation, or he would not have attributed the returning of the rays over the capitulum as expressed fig. H. to decay through age, which his subsequent observations informed him was owing to the hygrometric quality of the plant. This seems to be the only stellated *Lycoperdon* at present known in France, and therefore it is not to be wondered at that he has confounded it with *stellatum*.

XXXIII. *Additional Remarks on the Wood Sandpiper, Tringa glareola.*
By William Markwick, Esq. F. L. S.

Read June 4, 1793.

WHEN my description and figure of this bird were communicated to the Linnean Society, and which they thought proper to publish in the first volume of their Transactions, I thought it, on the authority of Messrs. Pennant and Latham, a distinct species, and a new discovery as a British bird; but, having since been favoured by Mr. Latham with some letters on the subject, and also a dried specimen of the *Tringa ocropus* (a bird that I had not seen before), I have little or no doubt that the *Tringa glareola* is a mere variety of that bird; for, according to my recollection of the bird, and on comparing the *Tringa ocropus* with my description and figure, they appear to agree very nearly in size and dimensions, the principal difference consisting in the colour of the plumage on some parts, which may probably be occasioned only by difference of sex or age.

XXXIV. Bo-

XXXIV. *Botanical Observations on the Flora Japonica.* By Charles Peter Thunberg, Knight of the Order of Wasa, Professor of Botany and Medicine in the University of Upsal, F. M. L. S.

Read Oct. 1, 1793.

INCRESCUNT quotannis Scientiæ, emendantur quotidie et ad fastigium suum optatum sensim sensimque, plurium virorum opera et studio junctis, feliciter properant. Deteguntur novæ terræ, novæque naturæ gazæ innotescunt, atque humano generi utiles evadunt. Sic non parum aucta fuit, præteritis et currentibus annis, Scientia Botanica, nec pauca sunt, quæ in usum et commoda mortalium indagarunt alacres peregrinatores et Scientiæ cultores indefessi. Postquam et mihi, plurium post annorum itinera reduci, anno 1784, in Flora Japonica Plantas Niponiæ descriptas publici juris facere contigisset, illas ulteriori examini, et accuratiori scrutinio subinde subjeci atque plura in hisce emendanda inveni. Has a me factas observationes, ne Scientiæ amatoribus lateant diutius, Illustri Societati, pro Historia Naturali promovenda institutæ, deque illa dudum bene meritæ, devotissime offero.

ORCHIS radiata: bulbis indivisis, nectarii alis amplioribus ciliatis.

Orchis fufannæ. Flor. Japon. p. 25.

LIMODORUM falcatum: cornu filiformi longissimo, foliis ensiformi-canaliculatis falcatis.

Orchis falcata. Flor. Japon. p. 26.

LIMODO-

LIMODORUM monile: scapo tereti striato moniliformi-articulato simplici, foliis linearibus acutis.

Epidendrum monile. Flor. Japon. p. 30.

Japonicè: Sekikokf et Fu Kan. Kämpf. Am. exot. fasc. v. p. 864. tab. 865.

Planta terrestris.

Vaginæ foliorum pluribus costis notatæ.

EPIDENDRUM nervosum: scapo angulato, foliis ovatis nervosis, labello integro reflexo.

Ophrys nervosa. Flor. Japon. p. 27.

EPIDENDRUM striatum: scapo angulato glabro, foliis ensiformibus nervosis, petalis lanceolatis, labello oblongo plano.

Limodorum striatum. Flor. Japon. p. 28.

Distincta planta à Limodoro striato, Kämpf. Icon. Sel. tab. 2.

EPIDENDRUM ensifolium: scapo tereti lævi, foliis ensiformibus striatis, petalis lanceolatis, labello recurvo latiore.

Limodorum ensifolium. Flor. Japon. p. 29.

Limodorum ensatum. Kämpf. Icon. Sel. tab. 3.

Cornu huic nullum.

FICUS erecta: foliis oblongis acutis glabris subtus reticulatis, caule decumbente ramis erectis, fructibus pedunculatis.

Ficus erecta. Dissert. Thunb. de Ficu, p. 9. Kämpf. Icon. Sel. t. 4.

Ficus pumila. β. Flor. Japon. p. 33.

FICUS stipulata: foliis oblique cordatis obtusis glabris, caule decumbente squamoso.

Ficus stipulata. Dissert. Thunb. de Ficu, p. 8.

IRIS japonica: barbata, foliis ensiformibus falcatis brevioribus glabris, scapo compresso multifloro.

Iris squalens. Flor. Japon. p. 33.

Japonicè:

Japonicè: Saga et Siaga. Kæmpf. Amoen. Exot. fasc. 5. p. 872.

Scapus compressus, articulatus, striatus, glaber, erectus, pedalis.

Folia ensiformia, equitantia, falcata, nervosa, glabra, scapo breviora.

Spathæ sub floribus foliis similes, obversæ, sensim breviores.

Flores axillares ex axillis spatharum.

Corollæ 1-petalæ, albæ, barbatae.

IRIS orientalis: imberbis, foliis linearibus, scapo sub-bifloro tereti articulato, germinibus trigonis, corollis reticulatis.

Iris sibirica. Flor. Japon. p. 33.

Scapus teres, striatus, glaber, articulatus, erectus, pedalis vel ultra.

Folia radicalia, linearia, equitantia, nervosa, glabra, apice attenuata, scapum æquantia.

Spathæ foliis similes, sensim breviores.

Flores circiter bini, subterminales.

Corolla imberbis, fusco-reticulata.

IRIS sibirica: imberbis, foliis linearibus, scapo sub-trifloro tereti, germinibus trigonis.

Iris sibirica. Linn. Syst. Veg. xiv. p. 91.

Japonicè: Koots Tsta.

Scapi et *folia* basi cæspitosa.

Flores cærulei.

IRIS ensata: imberbis, foliis linearibus, scapo sub-bifloro tereti, germinibus hexagonis.

Iris graminea. Flor. Japon. p. 34.

Scapus teres, nec anceps.

Germen hexagonum.

SACCHARUM japonicum: racemis fasciculatis, petalis ciliatis: exterioribus aristatis.

Saccharum polydactylon. Flor. Japon. p. 42. excluso fynonymo Linnæi.

CENCHRUS *purpurascens*: racemo spicato simplici, flosculis circumvallatis aristis longissimis, culmo erecto.

Panicum hordeiforme γ . Flor. Japon. p. 48.

Culmus erectus, bipedalis.

Folia culmo longiora.

Racemus subspicatus, laxis, spithamæus, pedunculis longitudine flosculorum distiche patulis.

Aristæ purpureæ, flosculo sexies longiores.

QUERIA *trichotoma*: floribus racemosis, caule trichotomo.

Rubia spicis ternis. Flor. Japon. p. 357. N° 44. inter obscuras.

VISCUM *japonicum*: caule prolifero ramoso aphylo: articulis trigonis.

Viscum opuntia. Flor. Japon. p. 64.

Rami dichotomi: articuli trigoni, oblongi, compressi, vix unguiculares, sensim minores, rugosi.

FAGARA *horrida*: foliis pinnatis: pinnis ovatis crenatis, spinis ramorum spinosis.

Fagara foliolis inæquilateris integris. Flor. Japon. p. 350. N° 3.

Japonensibus: Sai katfi.

Rami flexuosi, erecti, cinereo-purpurascens, elongati, glabri, subsimplices.

Spinæ sparsæ, rigidæ, purpurascens, patentes, pollicares, armatæ *spinulis* alternis, patentibus, minoribus.

Folia è gemmis plura, pinnata: *Pinnæ* oppositæ, subsessiles, multijugæ, ovatæ, obtusæ, tenuissime crenatæ, glabræ, virides, unguiculares.

Flores et *fructus* non vidi.

BOEMERIA *spicata*: foliis oppositis ovatis acutis ferratis glabris, spicis capillaribus interruptis.

Urtica spicata. Flor. Japon. p. 69.

Urtica japonica. Linn. Supp. p. 418.

Acalypha japonica. Houtuyn Nat. Hist. P. 2. tab. 72.

BOEMERIA *frutescens*: foliis alternis oblongis cuspidatis subtus niveis.

Urtica frutescens. Flor. Japon. p. 70.

Frutex urticæ foliis et facie, floribus crystallinis. Flor. Japon. p. 367. N° 98. huc referendus.

CONVOLVULUS *Nil*: foliis trilobis cordatis, pedunculis unifloris.

Ipomœa triloba. Flor. Japon. p. 86.

Differt ab *Ipomœa triloba* corolla campanulata, floribus solitariis, caule tereti, foliis pubescentibus.

LONICERA *flexuosa*: floribus subsessilibus, baccis distinctis, foliis ovatis integris glabris, caule flexuoso.

Lonicera nigra. Flor. Japon. p. 89.

Rami divaricati, flexuoso-erecti, teretes, villosi.

Folia opposita, petiolata, ovata, margine reflexo integra, nervosa, glabra, nervis parum villosa, pollicaria, superioribus minoribus.

Flores axillares, breviter pedunculati pedunculis vix lineam longis.

Baccæ distinctæ, ovatæ, acuminatæ, nigrae.

LOBELIA *radicans*: foliis lanceolatis undulatis ferratis, caule decumbente radicante.

Lobelia Erinus. Flor. Japon. p. 325.

Caulis herbaceus, decumbens, radicans, ramosus, filiformi-angulatus, glaber.

Rami

Rami rariores, erecti.

Folia alterna, lanceolata, sessilia, decurrentia, undulata, subdentata, patula, glabra, unguicularia.

Flores axillares, solitarii.

Pedunculi uniflori, folio duplo fere longiores.

LOBELIA *campanuloides*: foliis subpetiolatis lanceolato-oblongis dentatis, caulibus decumbentibus, pedunculis elongatis.

Lobelia erinoides. Flor. Japon. p. 326.

Caulis decumbens, sub-simplex, elongatus, filiformis, striatus, glaber, pedalis et ultra.

Folia alterna, subsessilia, lanceolata, acuta, obsolete ferrata, glabra, patentia, sub-pollicaria.

Flores terminales in ramis elongatis.

WEIGELA *japonica*: foliis sessilibus ovato-lanceolatis.

Weigela japonica. Flor. Japon. p. 90.

Japonice: Sima utfugi et Nippon utfugi. Kämpf. Am. Exot. fasc. v. p. 855.

Folia sessilia, lanceolato-ovata, pollicaria.

Petoli nulli.

WEIGELA *coræensis*: foliis petiolatis obovatis.

Japonice: Korei utfugi. Kämpf. Am. Exot. fasc. v.—p. 855.

Icon. Select. tab. 45.

Rami decussati, glabri, cinerei, erecto-patuli.

Folia petiolata, obovata, ferrata, acuminata, palmaria.

Petoli amplexicaules, sub-pollicares.

BLADHIA *glabra*: foliis oppositis ferratis glabris, caule erecto.

Bladhia foliis ferratis glabris lævibus. Flor. Japon. p. 350.

N° 5.

Differt ab hac *Bladhia japonica*, foliis ternis ferratis glabris, caule basi decumbente.

CELASTRUS scandens: inermis ramis scandentibus punctatis, foliis ovatis ferratis.

Celastrus punctatus. Flor. Japon. p. 97.

CELASTRUS dilatatus: foliis obovatis cuspidatis apice ferratis glabris, caule inermi.

Evonymoides baccis parvis. Flor. Japon. p. 354. N° 26.

VITIS flexuosa: foliis cordatis dentatis, subtus villosis, caule flexuoso, paniculis elongatis.

Vitis indica. Flor. Japon. p. 103.

Petioles filiformes, unguiculares.

Paniculae absque cirrhis.

VIBURNUM plicatum: foliis ovatis obtusis dentato-ferratis plicatis.

Viburnum dentatum. Flor. Japon. p. 122.

Flores radiati.

Folia magis rotunda, et dentes teneriores quam in *V. dentato*.

COMMELINA japonica: foliis ovato-lanceolatis undulatis, caule erecto angulato piloso, floribus paniculatis.

Caulis fulcatus, erectus, pilosus, apice paniculatus, pedalis.

Folia alterna, vaginantia, oblonga, acuta, undulata, glabra, inferiora digitalia, superiora pollicaria.

Flores in ramis paniculatis racemosi.

LILIUM cordifolium: foliis cordatis.

Hemerocallis cordata. Flor. Japon. p. 143.

Japonice: Sjire, rectius Sjiroi et Osjiroi. Kämpf. Amœn. Exot. fasc. v. p. 870. Icon. Select. tab. 46.

LILIUM speciosum: foliis sparsis ovato-oblongis, floribus reflexis, corollis revolutis, caule ramofo.

Lilium superbum. Flor. Japon. p. 134.

Japonice: Kasbiako, vulgo Konokko Juri, it. Corei Juri. Kämpf.

Kæmpf. Am. Exot. fasc. v. p. 871. Konokko Juri, Kæmpf.
Icon. Select. tab. 47.

LILIUM lancifolium: foliis sparsis lanceolatis, corollis erectis subcampanulatis.

Lilium bulbiferum. Flor. Japon. p. 134.

Caulis angulatus, hirsutus, erectus, simplex, pedalis et ultra.

Folia alterna, sessilia, lanceolata, glabra, digitalia, superiora sensim breviora.

Corollæ parvæ, unguiculares, albæ.

Axillæ foliorum superiorum bulbiferæ.

LILIUM longiflorum: foliis sparsis lanceolatis, corollis tubulato-campanulatis, caule glabro.

Lilium candidum. Flor. Japon. p. 133.

Japonice: Sjire, Sjiroi, Osjiroi et Siro Juri.

Crescit in Nagasaki, Miaco, alibi.

Floret Junio.

Caulis teres, nodulosus, glaber, inanis, erectus, bipedalis.

Folia sparsa, sessilia, lanceolata, integra, glabra, trinervia, basi adpressa, apice recurva, sesquipollicaria.

Corollæ albæ, tubulato-campanulatæ, palmares, erectæ.

Differt a *Lilio candido*: 1. foliis basi latioribus, apice acutioribus, strictioribus, reflexis, non undatis.

2. corolla triplo longiori, cylindrica.

Lilio bulbifero: 1. corolla maxima, alba.

2. caule lævi, tereti.

LILIUM bulbiferum: foliis sparsis lanceolatis, corollis campanulatis erectis, caule villoso.

Lilium philadelphicum. Flor. Japon. p. 135.

Caulis simplex, erectus, glaber, pedalis.

Folia

Folia inferiora sparsa, superiora terna et subquaterna, sessilia, basi lata, lanceolata, integra, glabra, nervosa, erecto-subimbricata, sesquipollicaria.

Corolla terminalis, erecta, petalis lanceolatis erectis.

Differt a Lilio philadelphico: 1. foliis basi latioribus.

2. corollis non revolutis.

LILIUM maculatum: foliis sparsis et verticillatis lanceolatis glabris, corollis campanulatis intus maculatis: limbo reflexo.

Lilium canadense. Flor. Japon. p. 135.

Caulis teres, striatus, glaber, simplex, inanis, pedalis, superne subumbellatus.

Folia sparsa et verticillata, sessilia, lanceolata, glabra, multinervosa, erecta, digitalia.

Flores subumbellati.

Pedunculi digitales, erecti.

Corolla campanulata limbo reflexo, incarnata intus maculis purpureis plurimis adspersa.

Differt a Lilio canadense: foliis basi latis et corollis minus revolutis.

ALETRIS farinosa: erecta foliis linearibus falcatis glabris, floribus spicatis.

Hypoxis spicata. Flor. Japon. p. 136.

SCILLA orientalis: floribus erectis racemosis, foliis elliptico-ensiformibus.

Scilla bifolia. Flor. Japon. p. 138.

Folia radicalia plura, inferne attenuata, ensiformia, glabra, spithamæa.

Scapus erectus, glaber, bipedalis, squamis alternis spathaceis.

Flores racemosi.

HEMEROCALLIS *lanceifolia*: foliis lanceolatis septemnerviis.

Hemerocallis japonica. Flor. Japon. p. 142.

HEMEROCALLIS *japonica*: foliis ovatis undulatis multinerviis.

Hemerocallis japonica. Kämpf. Icon. Select. tab. 11.

Folia radicalia, petiolata, ovata, acuminata, undulata, multinervia, transversim tenuissime venosa, glabra, palmaria.

Petoli alati, membranacei, palmares vel paulo ultra.

Flores ut in *Hem. japonica*.

TETRAGONIA *expansa*: foliis subcordatis ovatis punctatis, floribus axillaribus solitariis.

Tetragonia japonica. Flor. Japon. p. 208.

TERNSTROEMIA *japonica*: foliis acuminatis excisis.

Cleyera japonica. Flor. Japon. p. 224.

CORCHORUS *flexuosus*: foliis duplicato-ferratis cuspidatis, caule flexuoso.

Caulis teres, a foliis decurrentibus subangulatus, flexuosus, glaber, erectus, bipedalis.

Folia alterna, petiolata, oblique cordata, ovata, cuspidata, duplicato-ferrata, villosa, patula, bipollicaria.

Flores in ramis terminales, lutei.

CORCHORUS *ferratus*: foliis oblongis ferratis cuspidatis, ramis glabris.

Caulis erectus, glaber, ramosus.

Rami teretes, purpurei, glabri, erecti.

Folia alterna, petiolata, oblonga, ferrata ferraturis magnis apice fetaceis, cuspidata, supra tenuissime villoso-scabra, subtus glabra, bipollicaria, patula.

CORCHORUS *scandens*: foliis ovatis fetaceo-ferratis oppositis, caule ramisque flexuoso-scandentibus.

Caulis:

Caulis teres, scandens, ramosus.

Rami oppositi, similes, divaricati.

Folia opposita, brevissime petiolata, basi rotundata, ovata, acuminata, ferrata ferraturis setigeris, pollicaria.

Flos in ramulis terminalis, solitarius, flavus.

MIMOSA *speciosa*: inermis foliis bipinnatis: pinnis oblongis glabris, glandula supra costæ basin. *Linn. Syst.* xiv. p. 915.

Mimosa arborea. *Flor. Japon.* p. 229. Kæmpf. *Icon. Select.* tab. 19.

Legumina compressa, glabra, juniora villosa.

BEGONIA *grandis*: foliis inæqualiter ferratis glabris, caule angulato.

Begonia obliqua. *Flor. Japon.* p. 231. Kæmpf. *Icon. Select.* tab. 20.

Begonia grandis. Dryander *Act. Soc. Linn. Lond.* vol. I. p. 163.

MAGNOLIA *obovata*: foliis obovatis subtus parallelo-nervosis reticulatis.

Magnolia glauca. *Flor. Japon.* p. 236.

Japonice: Mokkwurèn. Kæmpf. *Am. Exot. fasc.* v. p. 845. *Icon. Select.* tab. 43 et 44. it. Fo no ki.

Folia obovato-oblonga, integra, glabra; subtus parallelo-nervosa et tenuissime reticulata nervis villosis, palmaria usque pedalia.

MAGNOLIA *tomentosa*: foliis ellipticis subtus tomentosis.

Magnolia glauca. *Flor. Japon.* p. 236.

Japonice: Mitsmata; item Kobus. Kæmpf. *Icon. Sel.* tab. 42.

Folia elliptico-lanceolata, acuta, petiolata, integra, supra glabra, subtus sericeo-tomentosa, palmaria.

Pedunculi breves, reflexi, fulcati, crassi, tomentosi.

CLEMATIS

CLEMATIS paniculata: foliis quinato-pinnatis: foliolis cordatis ovatis integris.

Clematis crispa. Flor. Japon. p. 239.

Japonice: Ikaliso.

Caulis flexuosus, scandens, striatus, glaber.

Rami alterni.

Folia petiolata, pinnato-quinata: *foliola* petiolata, cordata, ovata, acuta, indivisa, integra, glabra, inferiora majora, superiora minora.

Petoli flexuosi.

Flores axillares, albi.

Pedunculi triternato-paniculati, filiformes.

CLEMATIS trifoliata: foliis oppositis ternatis glabris: foliolis ovatis repando-dentatis, caule scandente.

Scandens foliis ternatis. Flor. Japon. p. 357. N° 43.

THALICTRUM japonicum: feminibus lævibus, foliis tripinnatis: pin-
nulis incisissimis serratis.

Didynamista *Salviæ* similis. Flor. Japon. p. 364. N° 74.

RANUNCULUS japonicus: foliis inciso-ternatis: lobis incisissimis dentatis, cauleque hirsuto.

Ranunculus asiaticus. Flor. Japon. p. 241.

Folia radicalia rotundata, suprema fissis, laciniis lanceolatis, omnia trifida laciniis iterum incisissimis, dentatis, acuta, utrinque hirsuta.

Petoli pollicares usque pedales, hirsuti.

Caules striati, hirsuti, vix foliosi, flexuosi, apice ramosi in pedunculos.

ARUM ringens: acaule foliis ternatis, spathe galeata receptaculo longiore.

Arum triphyllum. Flor. Japon. p. 233.

Folia ternata, omnino ut in aro triphylo; sed cuspidata.

Spatha galeata, ringens, cuspidata, spadice seu receptaculo longior, glabra, purpurascens, digitalis.

Receptaculum basi crassum, inde teres, incurvatum, album.

ARUM ferratum: acaule foliis radicatis ternato-pinnatis: foliolis ferratis, receptaculo spatha brevior.

Folia vaginantia, radicalia, bina, ternata: foliolum intermedium solitarium, petiolatum; lateralibus pedato-pinnatis; omnia oblonga, acuminata, ferrata, glabra.

Spatha receptaculo clavato duplo fere longior, acuminata.

MELITTIS japonica: foliis alternis ovatis obtusis inæqualiter ferratis, calyce villoso.

Melittis melissophyllum. Flor. Japon. p. 248.

Caulis erectus, villosus, simplex, spithamæus.

Folia alterna, petiolata, ovata, obtusa, inæqualiter et duplicato ferrata, villosa, patula, digitalia.

Petoli unguiculares.

Flores pedunculati, in axillis foliorum solitarii.

Pedunculus hirtus, pollicaris.

Calyces strigoso-hirsuti, cernui.

Ocymum scabrum: racemis simplicibus erectis, foliis ovatis subtus punctatis.

Ocymum punctatum. Flor. Japon. p. 249.

JUSTICIA crinita: pedunculo axillari solitario subquadrifloro, bracteis oblongis ciliatis.

Dianthera japonica. Flor. Japon. p. 21.

JUSTICIA lancea: floribus verticillato-aggregatis, foliis integris lanceolatis.

Radix

Radix fibrosa, annua.

Caulis herbaceus, erectus, tetragonus, uti tota planta tenuissime pubescens, ramosus, subpedalis.

Rami in inferiori parte similes, simplices, patuli, breves.

Folia petiolata, inferiora ovato-oblonga, superiora lanceolata, acutiuscula, integra, patula, pollicaria et ultra.

Petioles brevissimi, amplexicaules.

Flores in axillis verticillati, subsessiles, semper plures aggregati.

Braetee et *calyces* apice piliferæ.

CARDAMINE *scutata*: foliis ternatis scutatis crispis, caule subnudo.

Cardamine trifolia. Flor. Japon. p. 260.

JUNIPERUS *bermudiana*:

Juniperus barbadensis. Flor. Japon. p. 264.

JUNIPERUS *barbadensis*: foliis omnibus quadrifariam imbricatis: junioribus ovatis; senioribus acutis.

Juniperus virginica. Flor. Japon. p. 264.

DOLICHOS *umbellatus*: volubilis leguminibus subcylindricis rectis glabris.

Dolichos unguiculatus. Flor. Japon. p. 279.

Caulis volubilis, striatus, villosus.

Folia petiolata, ternata: foliola ovata, acuminata, integra, villosa; lateralia brevius, terminale longius petiolata, palmaria.

Flores subumbellato-racemosi, pedunculis petiolis longiores, flexuosi, palmares.

Legumina cylindrica, recta, glabra, pollicaria et ultra.

DOLICHOS *hirsutus*: volubilis leguminibus compressis hirsutis, foliolis exterioribus bilobis.

Japonice: Kudsu; it. Kadsune. Kæmpf. Icon. Select. tab. 41.

Caulis volubilis tomentosus.

Folia petiolata, ternata: foliola lateralia brevissime petiolata, biloba, subrotunda lobis mucronatis, subtus pallida, reticulata, utrinque tenuissime villosa, palmaria, intermedium petiolatum, indivisum, majus. *Petiolus* communis spithamæus, intermedii folioli pollicaris.

Flores racemosi, plurimi, purpurei.

Racemus sensim florens, spithamæus vel ultra.

Pedunculi tomentosi, unguiculares.

Legumina linearia, compressa, hirsuta villo longo flavescente, cuspidata stylo curvo persistente, digitalia.

Differt a D. uncinato: foliis lobatis, caule tomentoso, leguminibus compressis.

DOLICHOS cultratus: leguminibus cultratis dorso carinatis, caule flexuoso.

Dolichos ensiformis. Flor. Japon. p. 279. Kämpf. Icon. Sel. tab. 25.

GLYCINE javanica: foliis ternatis, caule villoso, petiolis hirtis, bracteis lanceolatis minutis.

Glycine javanica. Linn. Syst. Veg. xiv. p. 659.

Japonice: Fajo Mame.

Crescit propè Nagasaki.

Floret Septembri, Octobri.

PICRIS flexuosa: perianthiis hispidis, foliis dentatis cordato-amplexicaulibus, caule fulcato hispido.

Caulis fulcato-angulatus, flexuosus, fetaceo-hispidus, superne ramosus, erectiusculus, vix pedalis.

Folia alterna, omnia sessili-amplexicaulia, subcordata, oblonga, villoso-scabra, inferiora digitalia, superiora sensim minora.

Flores

Flores in ramis terminales, solitarii.

Pedunculi seu rami alterni, simplices, hispidi.

Calyx duplex, hispidus, inferior reflexus.

Corollæ luteæ, pappo albo plumoso.

POLYPODIUM *ensatum*: fronde elliptico-ensiformi, glabra, integra, fructificationibus sparsis.

Polypodium phyllitis. Flor. Japon. p. 335.

Frons elliptico-ensiformis, acuminata, integra, erecta, glabra, spithamæa usque pedalis.

Fructificationis puncta sparsa, solitaria juxta costam mediam in apice, duo vel plura inter nervos in medio, orbiculata.

POLYPODIUM *sophoroides*: frondibus pinnatis: pinnis ensiformibus inciso-ferratis, ferraturis semiovatis nervosis, infima ferratura superne longiori.

Polypodium unitum. Flor. Japon. p. 336.

Frons pedalis vel ultra, pinnata, glabra: *Pinnæ* lanceolatae, acutæ, inciso-ferratae; ferraturæ ovatae, parallelo-nervosæ, mucronatae, sæpe a marginibus revolutis subfalcatae; ferratura infima in basi a latere superiori longior. *Pinna* terminalis simplex, inciso-ferrata. *Puncta* fructificantia juxta margines incisurarum.

Differt a *P. unito*, cui valde similis: pinnula vel ferratura baseos pinnarum a latere superiori longiori.

DICKSONIA *strigosa*: frondibus bipinnatis: pinnulis rhombeis pilosis ferratis, fructificationibus solitariis.

Trichomanes strigosum. Flor. Japon. p. 339.

CAENOPTERIS *japonica*: frondibus supradecompositis: pinnulis inciso-trifidis acutis.

Trichomanes japonicum. Flor. Japon. p. 340.

ASPLENIUM incisum: frondibus pinnatis: pinnis subrotundi incis
ferratis.

Asplenium trichomanes. Flor. Japon. p. 334.

Fronde è radice plures, erectiusculi vel diffusi, pinnati, glabri,
digitales et ultra. *Pinnæ* subsessiles, alternæ, subrotundæ,
dentato-ferratæ; inferiores incisæ, subtrilobæ; semiunguicu-
lares, supremi minores.

XXXV. Description of *Sagina cerastoides*, a new British Plant discovered in Scotland by Mr. James Dickson, F. L. S. By the President.

Read Nov. 5, 1793.

SAGINA CERASTOIDES.

S. caule diffuso dichotomo, foliis spatulatis obovatisve recurvis, pedunculis fructiferis reflexis.

Habitat in arenosis maritimis et fissuris rupium, in Bodotriæ insulis.

Junio, Julio. ☉ ?

Herba facie *Cerastii*, sed floribus semper quadrifidis.

Radix fibrosa, annua ut videtur.

Caules plurimi, diffusi, spithamæi, teretes, foliosi; basi attenuati, glabriusculi, alternatim ramosi; supernè magis pubescentes, dichotomi, geniculis tumidiusculis, pallidis, ramulis divaricatis.

Folia opposita, patenti-recurva, integerrima, acuta, mollia, utrinque pubescentia; subtus pallidiora atque nitidiora, venulis rectis, longitudinalibus; inferiora spatulata, longius petiolata; superiora obovata, sessilia; summa ovata. *Stipulae* nullæ.

Flores

Flores è dichotomiâ caulis, solitarii, primo subsessiles, statim pedunculati; *pedunculis* uncialibus, filiformibus, pubescentibus; fructiferis reflexis.

Calyx è foliolis quatuor, parum patentibus, lanceolatis, acutis, concavis, basi obtusè carinatis, extùs pubescentibus, intùs lucidis; quorum duo opposita angustiora sunt, margineque membranacea.

Petala quatuor, calyce ferè duplo breviora, cuneiformia, alba, tenuissima, apice bifida, lobis acutis, rectis.

Stamina quatuor, æqualia, petalis alternantia parumque breviora. *Filamenta* capillaria, alba. *Antheræ* parvæ, subrotundæ, luteolæ.

Pistillum. *Germen* ovatum, longitudine staminum, pallidè virescens, glabrum. *Styli* quatuor, brevissimi, erecti. *Stigmata* recurva, villosa, alba.

Capsula cylindrica, longitudine calycis, aureo nitens, apice dehiscens denticulis octo, triangularibus, obtusissimis.

Semina numerosa, luteo-fusca, subcuneiformia, depresso, basi emarginata, margine scabriuscula.

THIS plant was first discovered by Mr. Dickson on the rocky and sandy shores of Inch-Keith and Inch-Combe in the Firth of Forth, as well as on the beach below Prestonpans. Its habit is altogether that of a *Cerastium*, most nearly resembling *C. semidecandrum*, *pentandrum* and *vulgatum*. But its flowers being

4

constantly

constantly quadrifid, oblige us to refer it to the genus of *Sagina*, with which they exactly agree; more especially as the genera in this natural order are scarcely to be discriminated without taking into consideration the comparative number of the parts of fructification.

The flowers are scarcely to be found expanded except in a sunny afternoon.

XXXVI. *An Account of two new Genera of Plants from New South Wales, presented to the Linnean Society by Mr. Thomas Hoy, F. L. S. and Mr. John Fairbairn, F. L. S. By the President.*

Read Nov. 5, 1793.

GOODENIA.

Pentandria Monogynia. *Fl. monopetali, superi.*

CHAR. GEN. *Caps.* bilocularis, bivalvis, polysperma; dissepimento parallelo. *Semina* imbricata.

Corolla supra longitudinaliter fissâ, genitalia exserens; limbo quinquefido, secundo.

Antheræ lineares, imberbes.

Stigma urceolatum, ciliatum.

THIS genus belongs to the order of *Campanulaceæ* of M. de Jussieu, the first section, *Antheris distinctis*, and ought to be there inserted between *Cyphia* and *Scævola*, and in the Linnean System between the latter and *Cinchona*.

It differs essentially from *Scævola* in its fruit, from *Cyphia* in its corolla, and from *Lobelia* in its stamina.

I have given to this new and most distinct genus the name of *Goodenia*, in honour of my worthy friend the Rev. Dr. Goodenough, treasurer of this Society, of whose botanical merits it would be super-

superfluous to say any thing in a volume which contains his Dissertation on the British species of *Carex*. In the construction of this name I have followed the example of Tournefort, who formed *Gundelia* from Gundelscheimer, a word (like Goodenough) too long to be retained entire in a generic name.

I am possessed of eight very distinct species of this genus, of which I shall give the specific characters, more particularly describing the first, for which we are obliged to Mr. Hoy, who has it alive in Sion Gardens.

I. *GOODENIA ovata*.

G. foliis ovatis denticulato-ferratis corollisque glabris, fructu lineari.

Oval yellow Goodenia.

Stem shrubby, erect, angular, branched, leafy.

Leaves alternate, on footstalks, without stipulæ, ovate, varying a little in breadth, acute, ferrated with fine, sharp, spreading, rather unequal teeth, of a bright green, veiny, smooth on both sides, paler beneath. *Footstalks* channelled above, with a tuft of down in their axillæ.

Flowers yellow, from 3 to 5 in a dichotomous panicle, arising solitary from each axilla of the uppermost leaves, and above half as long as the corresponding leaf. *Footstalks* somewhat angular, smooth, with 2 subulate bractæ at each subdivision.

Calyx of 5 equal, subulate, erect, smooth leaves, permanent.

Corolla tubular, the *tube* cloven on the upper side from top to bottom, smooth, greenish and striated externally. *Limb* in 5 equal, obovate segments, all directed forwards, yellow, membranous,

branous, with a thick greenish plait running from the tube to the point of each behind.

Stamina 5, shorter than the tube, and projecting through its fissure.

Filaments inserted into the receptacle, equal, perfectly distinct.

Antheræ nearly linear, vertical, two-celled.

Pistillum. *Germen* inferior, long, slender, smooth, with 5 angles.

Style simple, somewhat longer than the stamina and standing out with them, smooth. *Stigma* large, cup-shaped, bent down towards the stamina, finely ciliated on the margin.

Capsule oblong, crowned with the calyx, two-celled, and of two valves, which burst at the top, and then become revolute, the partition, which is parallel to them, remaining erect. *Seeds*, several in each cell, imbricated, lenticular, roughish, encircled with a groove.

This plant was presented to the Society by Mr. Hoy in flower December 4, 1792.

A figure of it exists among the hitherto unpublished plates of Sir Joseph Banks.

2. *G. albida*.

G. foliis obovatis dentatis corollisque glabris, stylo cauleque piloso.
White-flowered Goodenia.

For specimens of this and all the following, except *G. paniculata*, I am obliged to John White, Esq. surgeon at Port Jackson, who gathered them wild in that country.

3. *G. paniculata*.

G. foliis obovato-lanceolatis dentatis corollisque pilosis, caule nudiusculo paniculato.

Panicled yellow Goodenia.

Gathered at Port Jackson by Mr. David Burton. *H. Banks.*

4. *G. bel-*

4. *G. bellidifolia.*

G. foliis obovatis denticulatis carnosis, caule nudiusculo spicato, corolla extus hirsuta, fructu quadrivalvi.

Daisy-leaved yellow Goodenia.

5. *G. stricta.*

G. foliis lanceolatis integris dentatisve carnosis glabris, corolla extus hirsuta, stigmate ore contracto.

Rigid blue Goodenia.

This grows naturally in marshy ground, flowering in October.

6. *G. ramosissima.*

G. foliis lineari-lanceolatis subdentatis cauleque hispidis, stylo apice hirsutissimo, corolla extus pilosa.

Branching blue Goodenia.

Flowers in October.

7. *G. heterophylla.*

G. foliis integris dentatis lobatisve pilosis, fructu subrotundo, corolla nudiuscula.

Various-leaved Goodenia.

8. *G. hederacea.*

G. foliis subrotundis integris quinquelobisve, corolla extus lanata, caule prostrato.

Trailing Goodenia.

Of the colour of the flowers in this species and the preceding I have no means of judging.

PLATYLOBIUM.

Diadelphia Decandria. *Stamina omnia connexa.*

CHAR. GEN. *Calyx* campanulatus, quinquefidus, laciniis duobus supremis maximis, obtusis.

Filamenta omnia basi connexa, latere superiori distincta.

Legumen pedicellatum, compressum, dorso alatum, polyspermum.

THIS genus belongs to the 5th section of M. de Jussieu's order of *Leguminosæ*, and may be inserted near *Crotalaria* in the Linnean system.

Its name I have deduced from *πλατύς* broad, and *λόγος* a pod.

The two large segments of the calyx, and the flat upper margin of the pod, abundantly distinguish it from all other genera.

We are hitherto acquainted with only one certain species of this genus, seeds and specimens of which have been sent from New South Wales, and which may justly be called

PLATYLOBIUM *formosum*.*Orange flat-pea.*

Stem shrubby, four feet high. Branches opposite, round, roughish, covered with leaves, and ornamented with numerous flowers.

Leaves

Leaves opposite, on very short hairy footstalks, cordato-ovate, entire, revolute, acute, with a minute spine at the end, very veiny, rigid, of a beautiful green, glaucous beneath. *Stipulae* in pairs, lanceolate, brown, membranous, striated, smooth.

Flowers solitary, from the axillæ of the uppermost leaves, opposite, on short hairy footstalks. *Bractæe* several at the base of the footstalk, ovate, concave, and hairy, and two at the top, immediately under the flower, which are somewhat longer.

Calyx very hairy, campanulate, permanent, with 5 teeth; the 3 lowermost of which are acute and spreading, the 2 uppermost very large, obovate, obtuse, close pressed to the standard.

Corolla papilionaceous. *Standard* twice as long as the calyx, spreading, deeply emarginate, orange-coloured, striated almost half way to the edge, with beautifully radiant crimson lines, from a pale-yellow spot at the base. *Wings* deep yellow, shorter than the standard, semi-obovate, with a blunt incurved tooth on the upper side at their base. *Keel* of 2 adhering petals, obtuse, as long as the wings, whitish tipped with a rich crimson, and furnished on each side of the base with a tooth embraced by the incurved teeth of the wings.

Stamina in one set, separated only on the upper side, and cloven nearly half their length into ten equal filaments, which are curved upwards. *Antheræ* 10, nearly orbicular, equal, versatile.

Pistillum. *Germen* linear, very hairy. *Style* incurved, smooth. *Stigma* simple, sharp.

Pod

Pod about an inch and a half long and half as broad, on a short footstalk, clothed with scattered hairs, somewhat scimeter-shaped, perfectly compressed, obtuse, with a small point, of one cell, and extended into a flat border along the upper edge, considerably beyond the insertion of the seeds. *Seeds* 7 or 8, black, compressed, each standing on a curved white pedicle.

This shrub blooms abundantly in its native country all the year through. It has likewise flowered in several gardens in England. Mr. Fairbairn presented a living specimen to the Society last summer.

A figure of this beautiful plant will soon be given in the work I have undertaken on the *botany* of *New Holland*.

XXXVII. EXTRACTS *from the* MINUTE BOOK *of the* Linnean Society.

June 1, 1790. **T**HE PRESIDENT read a letter from Aylmer Bourke Lambert, Esq. F. L. S. giving an account of *Andromeda Daboecii* and *Saxifraga umbrosa* growing wild in the west of Ireland; the latter on a hill called Crow Patrick, in the county of Mayo, the former on several other mountains in that county.

Jan. 4, 1791.—The Rev. Dr. Goodenough exhibited a specimen of the Soland Goose, *Pelecanus Bassanus*, recently shot on the coast of Suffex.

July 5.—The Rev. Mr. Martyn communicated the following extract of a letter from Miss Anne Welch of Ardenham hill near Aylesbury.

“ In the year 1788 I removed several plants from Hampstead to
 “ a garden I was then making near Aylesbury. The soil consisted
 “ of deep clay manured with pond mud, sand, and dung in some
 “ parts; in others it was a compost formed of the ruins of build-
 “ ings, and lime-stone, mixed with a mould produced from a
 “ variety of animal and vegetable substances. This compost
 “ varied in depth, quality, and number of materials.

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“ My

" My plants were first placed in the clayey soil. Amongst
 " them was the *Hemerocallis fulva*. I never was possessed of the
 " *flava*, till it was produced by accident as follows, from the cul-
 " ture of the only plant of the *fulva* that grew in my garden.
 " The succeeding year I divided my *Hemerocallis*, and planted part
 " of it in a shallow bed of the compost formed from the ruins,
 " &c. taking care to move it with a large ball of earth at the
 " roots, which shot very freely, so that I was able to take off
 " another part of the plant, and the same summer I placed that
 " in the same bed. When the last plant flowered, I was agreeably
 " surprised with the sight of an *Hemerocallis flava*. Last year I
 " had these plants varying in size and colour, large and of a deep
 " tawny hue; small and absolutely yellow; and also of a pale
 " tawny, and of a size between the *fulva* and *flava*."

This communication was accompanied by specimens of the
 above-mentioned varieties.

Dec. 6.—The following miscellaneous remarks from Mr. James
 Hoy (now F. L. S.) were read.

" *Juncus articulatus* β Linn. *Flo. Suec.* 113, mentioned also in
 " *Lightf. Flo. Scot.* 185, supposed by the former to be a viviparous
 " variety, and by the latter to be a disease occasioned by an insect
 " of the *Coccus* tribe, appears to be occasioned by the *Chermes gra-*
 " *minis*. For many years past I have noticed this appearance,
 " but without any satisfaction till September last, when among
 " several plants of that kind which came in my way in the course
 " of a week, I picked up one upon which I found some insects
 " that appeared to be the *larvæ* of a *Chermes*, as they were covered
 over

“ over with the downy cotton-like substance, which characterizes
 “ most of that genus. Upon other specimens gathered about the
 “ same time and kept in water the same insects appeared in a
 “ day or two. At length some of them having divested them-
 “ selves of their exuviae, were found to agree with Linnæus’s de-
 “ scription of his *Chermes graminis*. This species is said by him
 “ to live on the *Aira flexuosa*, on which I have not yet found it,
 “ though I searched for it particularly when these insects were
 “ most plentiful upon the above *Juncus*.

“ There is no doubt therefore that the *Chermes graminis* lives upon
 “ the plant in question, and is the cause of its producing these
 “ leafy *utriculi* instead of stalks and flowers. In the same manner the
 “ *Chermes abietis* causes the tubercles found on some branches of the
 “ spruce fir instead of young shoots and leaves; and as the trees
 “ upon which these tubercles are found are not, upon that ac-
 “ count, reckoned varieties of the spruce fir, so the plants that have
 “ some, or even the whole, of their stalks and leaves contracted
 “ into short bunches, ought not to be considered as varieties of the
 “ *Juncus articulatus*.”

— — —

“ Mr. Lightfoot mentions in the *Flora Scotica* that he does not
 “ remember to have found the *Agaricus deliciosus* in Britain. It
 “ grows however plentifully in the fir plantations here, about the
 “ beginning of October, and will therefore it is hoped have a place
 “ in every future *Flora Scotica**.”

* Dr. Smith, P. L. S. found this *Agaricus* in Rivestone wood near Edinburgh, 1782, and on the Marchioness of Rockingham’s lawn at Hillingdon, Middlesex, under some fir trees, in Oct. 1793. Mr. Hudson mentions it as growing near Guildford.

“ It is a general character of deer, that the females of every
“ species except the rein deer, are destitute of horns. A singular in-
“ stance to the contrary occurred here in September last. A hind,
“ the female of *Cervus Elaphus*, was shot by the Duke of Gordon,
“ which had one horn perfectly similar to that of a stag three
“ years old. It had never had a horn on the other side of its
“ head, for there the corresponding place was covered over by
“ the skin, and quite smooth. It did not seem to have ever pro-
“ duced a fawn, and upon dissection, the ovarium *on the same side*
“ *with the horn was found to be scirrhus.*”

April 3, 1792.—Mr. Teesdale, F. L. S. presented a wild specimen of *Eriophorum alpinum* found in Scotland, though not before known to be a British plant.

Nov. 6.—A wild specimen of *Pyrola uniflora*, found plentifully in the fir woods near Brodie-house, in the county of Moray, Scotland, was sent by Mr. James Hoy, F. L. S.

The President read part of a letter from Dr. Swartz, F. M. L. S.
dated Oct. 4, 1792, as follows.

“ I am sorry for the fault in the characterising of *Canella alba*
“ (Transf. of L. Soc. vol. i. p. 100). Notwithstanding num-
“ berless observations on the fruit, I found too late that I had
“ been deceived. Indeed most plants require repeated observa-
“ tions before they can be fully known. The germen has three
“ cells. It is true, however, that in the ripe fruit one cell only con-
“ tains seeds, the rudiments of the other two being rarely to be seen.”

Jan.

Jan. 8, 1793.—The President presented a specimen of *Convallaria verticillata*, a new British plant, gathered in the Den Rechip, a deep wooded gulley, from the hills in the Stormont, Perthshire, about four miles north-east of Dunkeld, by Arthur Bruce, Esq. Secretary to the Nat. Hist. Society of Edinburgh.

Feb. 5.—The Rev. Mr. Hugh Davies, F. L. S. communicated drawings of the *Cancer Bufo*, Herbst. t. 17. f. 95, and the *Phalangium grossipes*, Linn. both caught on the sea coast of Anglesea.

May 7.—The President presented a specimen of *Trifolium suffocatum*, found wild on the sands about Yarmouth, by Mr. Lilly Wigg, A. L. S.

F I N I S.

Jan. 8, 1793.—The President presented a specimen of *Conus* (a new British plant) gathered in the Farnham, a deep wooded valley, from the hills in the Somerset, Bathing, about four miles north-east of Dinkfield, by Arthur Bruce, Esq. Secretary to the Nat. Hist. Society of Edinburgh.

Feb. 5.—The Rev. Mr. Hugh Davies, F. L. S. communicated drawings of the *Conus* (a new British plant) gathered in the Farnham, a deep wooded valley, from the hills in the Somerset, Bathing, about four miles north-east of Dinkfield, by Arthur Bruce, Esq. Secretary to the Nat. Hist. Society of Edinburgh.

May 7.—The President presented a specimen of *Conus* (a new British plant) gathered in the Farnham, a deep wooded valley, from the hills in the Somerset, Bathing, about four miles north-east of Dinkfield, by Arthur Bruce, Esq. Secretary to the Nat. Hist. Society of Edinburgh.



FINIS

Dr. GOODENOUGH wishes to alter some erroneous passages in his paper, and to add the following note.

Page 133, line 9, for *them*, read *themselves*.

Page 140, line 14, strike out the words *sæpius sub-distichæ*, which was an error in transcribing.

In pages 137 and 169, *Carex strigosa* should be described *spicis recurvis* instead of *pendulis*.

Page 155, line 7 from the bottom, read *complete* for *accurate*.

Page 157, line 13, a semicolon should be placed after the word *composita*.

Page 189, line 11, the *hyphen* is an error of the press.

Page 200, line 13, *auriculatâ* an error of the press for *auriculâ*.

There are others of less importance which it is needless to mention.

Since my Observations have been printed, I have received from my friend Mr. Daval, specimens of the *Carex* described by Scheuchzer p. 497, and figured t. 11. f. 9 and 10. quoted by Linnæus for *C. dioica*. It seems a distinct species, and will be the subject of consideration when I come to treat of the foreign Carices. I have also received from my friend the Rev. Mr. Williams of Eaton near Shrewsbury, specimens of *C. hirta*, with smooth vaginæ—I would therefore wish the words *vaginis hinc lanato-villosis* to be omitted in the specific description—and would beg leave to insert after the long description—*Planta in aquosis variat vaginis glabris*.



Dr. Goodenough wishes to alter some erroneous passages in
his paper, and to add the following note.

Page 135, line 9, for *them*, read *the same*.

Page 140, line 14, strike out the words *Aspirin* *Aspirin*,
which was an error in transcribing.

In pages 137 and 138, *Clare* *Aspirin* should be described *Aspirin*
Aspirin instead of *Aspirin*.

Page 155, line 7 from the bottom, read *Aspirin* for *Aspirin*.

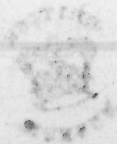
Page 157, line 23, a semicolon should be placed after the
word *Aspirin*.

Page 159, line 11, the word *Aspirin* is an error of the press.

Page 200, line 13, *Aspirin* and an error of the press for *Aspirin*.

There are others of less importance which it is needless to
mention.

Since my observations have been printed, I have received from my
friend Mr. Davis, specimens of the *Clare* described by Schenck
p. 137 and figured p. 138, 9 and 10, quoted by him as for
Clare. It seems a distinct species, and will be the subject of
consideration when I come to treat of the foreign *Clare*. I have
also received from my friend the Rev. Mr. Williams of Baton
rouge, Louisiana, specimens of *Clare* with smooth margins, and
which he refers to the same species as the one described by Schenck
red in the specific description—and would have to be referred
to the long description—*Platanus* in regard to its origin.



EXPLANATION of the PLATES of Dr. GOODENOUGH's Paper on
CARICES.

PLATE 19.

- FIG. 1. *Carex axillaris*.—N. B. The long foliaceous bractea, which subtends the lowermost cluster of spiculæ, is by accident omitted.
2. *Carex divisa*.—The small figure represents the spike at its first appearance—The large one exhibits it in its more advanced state—Underneath is the germen with its gluma or squama.
3. *Carex teretiuscula*.—The small figure represents the spike at its early appearance—Underneath it is a transverse section of the culm, to shew its roundishness—The larger figure shews it in its more advanced state, when the panicle separates a little—The figure does not sufficiently express the supra-decomposition of the spike—Underneath is a capsule, placed so as to shew the gibbosity of the exterior part.

PLATE 20.

4. *Carex strigosa*.—The spikes represented as they appear before the ripe seeds weigh down their extremities. Underneath is the fructification in its various stages, with the glumæ or squamæ.
5. *Carex filiformis*.—Represented in a state of fructification, with the germen, stamina and glumæ underneath.
6. *Carex fulva*.—In both its early and advanced stage—Underneath are the stamina and germen with their glumæ—A ripe capsule is added, but the figure does not represent it sufficiently beaked.

PLATE 21.

7. *Carex extensa*.—Both figures are drawn from specimens in their most advanced state—Underneath is a ripe capsule, with its gluma or squama.

FIG.

EXPLANATION, &c.

- FIG. 8. *Carex stricta*.—In the figure of the younger plant the leaves, which grow close to the culm and parallel to it, are drawn open to shew the reticulated filaments—Underneath are the stamina and germen with the squamæ.
9. *Carex caespitosa*.—Both specimens in a state of inflorescence—Underneath are the stamina and a capsule nearly ripe, with their squamæ.

PLATE 22.

10. *Carex rigida*.—In both its early and advanced stage—Underneath are the stamina and germen with their glumæ or squamæ—There is added a ripe capsule—It is very seldom so obtuse as is represented in the figure here given.

N. B. In p. 151, line 17, for *oblongæ sessiles aggregatæ* read *oblongis sessilibus aggregatis*.

